Railway Engineering and Maintenance

DECEMBER, 1944

IE NATIONAL LOCK WASHER COMPANY, NEWARK, N. J., U. S. A.

Reliance **HY-CROME** *Spring Washers*

THERE *Must* BE A REASON?

"Edgemark of Quality"

● It is not entirely the quality control of HY-CROME Spring Washer manufacture, or the extensive laboratory or field research, which dictates their design and physical properties. *It Is the Way They Do Their Job.*

● HY-CROME Spring Washers have grown in use yearly because they function successfully in keeping track bolts tight and under constant and adequate tension to compensate for looseness resulting from wear.

● In 1944 HY-CROME applications established many service records, as well as providing, more efficiently and economically, longer life for track assemblies. *Write for Track Folder No. 10.*

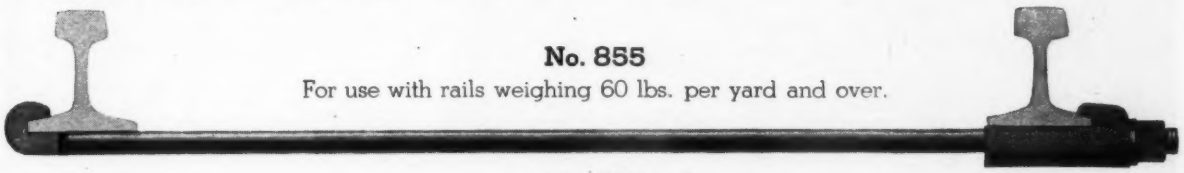
EATON MANUFACTURING COMPANY
RELIANCE DIVISION MASSILLON, OHIO
Sales Offices: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

WHY
BETHLEHEM GAGE RODS
mean less work for maintenance crews

In these days of manpower shortages, when even minutes are at a premium, Bethlehem Gage Rods are saving plenty of time each week for thinned-out maintenance crews.

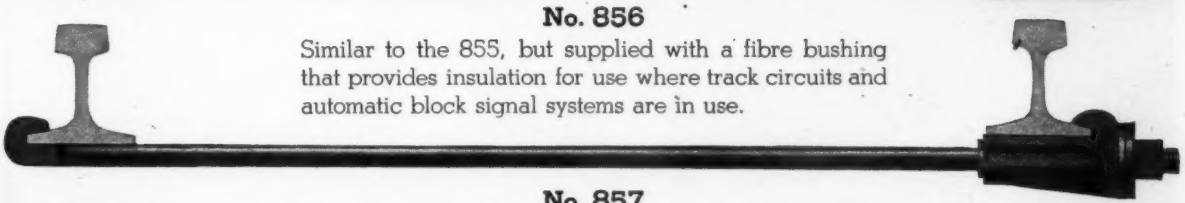
Installation is simplicity itself. A forged steel hook on one end and a heavy, adjustable clip on the other fit snugly over the outside edges of the rail flanges, thus providing a means of holding track in correct alignment and distributing the lateral thrust of the wheels. As a result, frequent regaging of the track is unnecessary—and the hours saved can be invested in other types of maintenance work so vital under today's conditions.

Bethlehem Gage Rods are furnished in four designs:



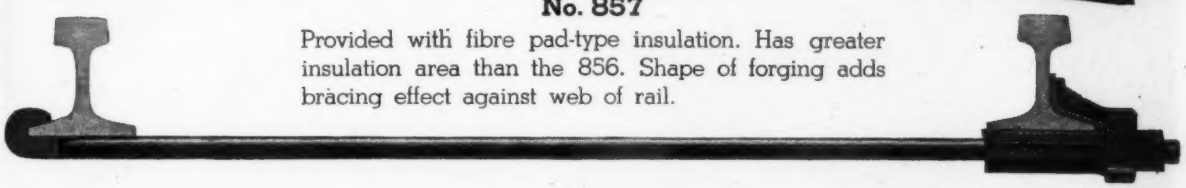
No. 855

For use with rails weighing 60 lbs. per yard and over.



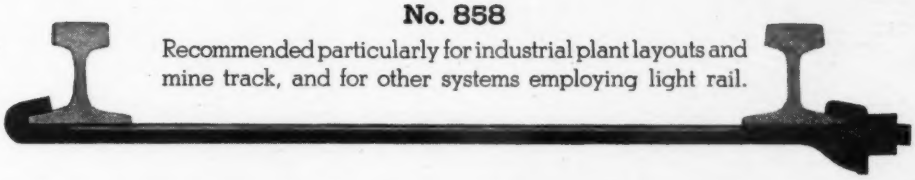
No. 856

Similar to the 855, but supplied with a fibre bushing that provides insulation for use where track circuits and automatic block signal systems are in use.



No. 857

Provided with fibre pad-type insulation. Has greater insulation area than the 856. Shape of forging adds bracing effect against web of rail.



No. 858

Recommended particularly for industrial plant layouts and mine track, and for other systems employing light rail.

Where to use Bethlehem Gage Rods

ON TRESTLES, BRIDGES, AND BRIDGE APPROACHES ★ AT FROG HEELS AND AHEAD OF SWITCH POINTS
IN TUNNELS ★ ON CAR FLOATS ★ ON CURVES ★ AT STANDPIPES ★ AT ASH PITS
IN MINE AND PLANT LAYOUTS ★ AT WATER TOWERS ★ IN ROUNDHOUSE AND TURNTABLE LEADS

and at many other points along standard and narrow-gage tracks. Ask a Bethlehem engineer to give you the full story.

BETHLEHEM STEEL

Published monthly by Simmons Boardman Publishing Corporation, 105 W. Adams St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00; Foreign, $3.00. Single copies 35 cents. Entered as second-class matter January 20, 1933, at the postoffice at Chicago, Ill., under the act of March 3, 1879, with additional entr yat Mount Morris, Ill., postoffice. Address communications to 105 W. Adams St., Chicago 3, Ill.

BARCO TYTAMPERS

keep TRACKS in good shape the world over

Tracks that keep rolling stock on the way, supplies moving to all the fronts, must have careful up-keep these days. Barco Unit Tytampers enable you to get more work done . . . faster . . . with smaller crews to handle the jobs. Eleven special tool attachments.

THE FREE ENTERPRISE SYSTEM IS THE SALVATION OF AMERICAN BUSINESS

BARCO MANUFACTURING COMPANY, NOT INC., 1805 Winnemac Ave., Chicago 40, Ill. • In Canada: The Holden Co., Ltd., Montreal, Can.

The one-man bar which eliminates spike maul driving

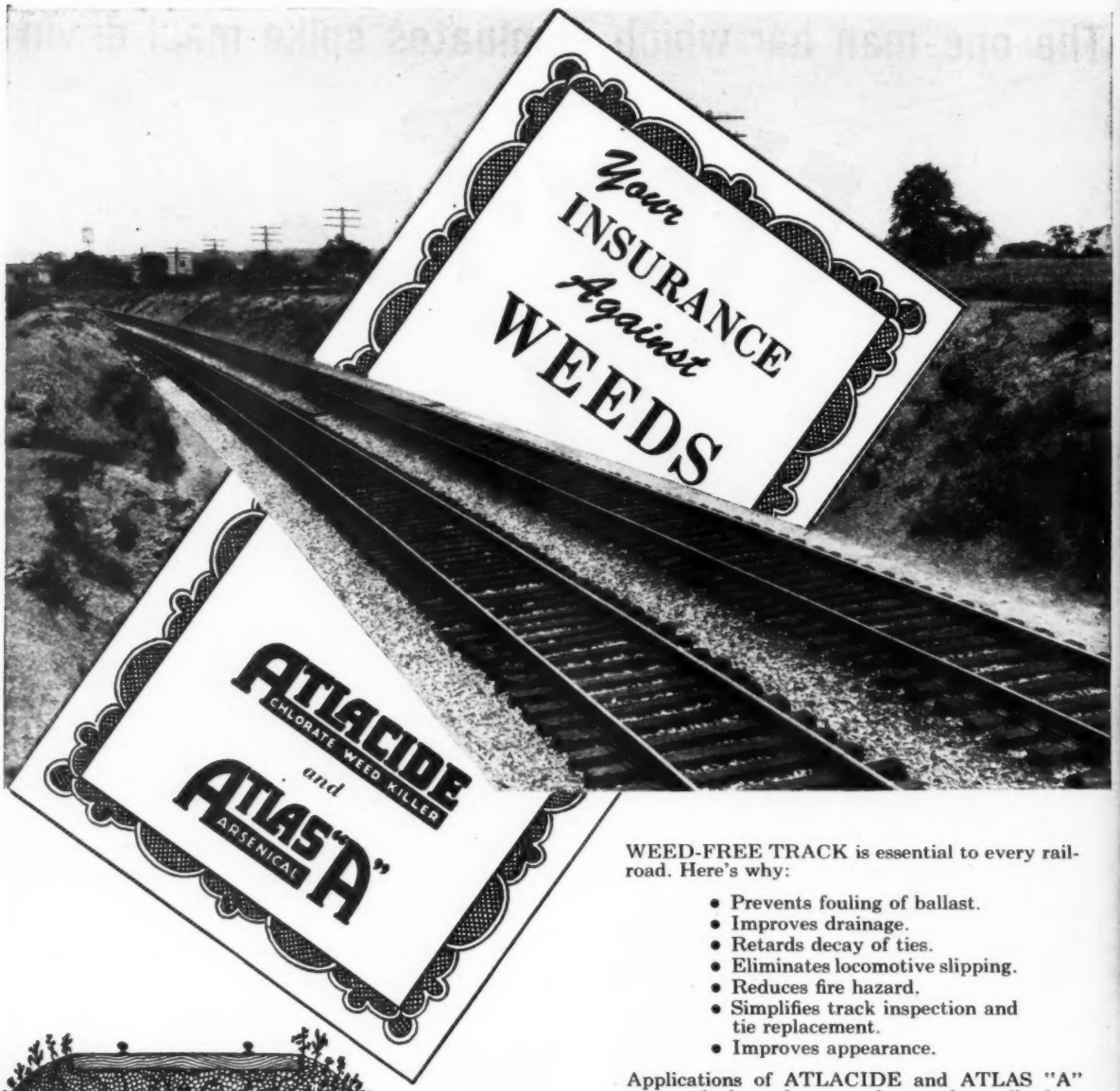
Flex-Toe Claw Bars

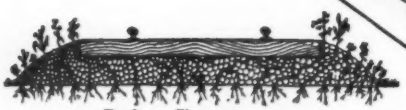
Workmen throw Flex-Toe Claw Bars on the spikes in the usual way. The alloy steel toes automatically take a firm grip on any piece of protruding metal. Out come ordinary spikes, headless spikes, stubs, brine-eaten spikes, and boat spikes quickly and easily. The harder the pull on the handle, the tighter the Flex-Toe Bar holds.

Equipped with foolproof, easy-to-handle Flex-Toe Bars, two men can pull as many spikes as three men can with ordinary bars.

Our deliveries on Flex-Toe Claw Bars have improved. *Place your order today.*

WARREN TOOL CORP. • WARREN, OHIO





Before Treatment—

After Treatment—ROOTS DIE

Final Results—CLEAN BALLAST

WEED-FREE TRACK is essential to every railroad. Here's why:

- Prevents fouling of ballast.
- Improves drainage.
- Retards decay of ties.
- Eliminates locomotive slipping.
- Reduces fire hazard.
- Simplifies track inspection and tie replacement.
- Improves appearance.

Applications of ATLACIDE and ATLAS "A" progressively reduce weed growth until clean track is obtained. At the same time the "annual premium" for protection against weeds is correspondingly reduced. The point is soon reached where all future treatments are confined to checking new growth at a minimum cost.

Atlacide and Atlas "A" then "pay dividends" in lower maintenance cost and better maintained track.

Now is the time to make plans for weed control next season. We invite your inquiry for thorough discussion of your particular weed problems and offer our service in their solution.

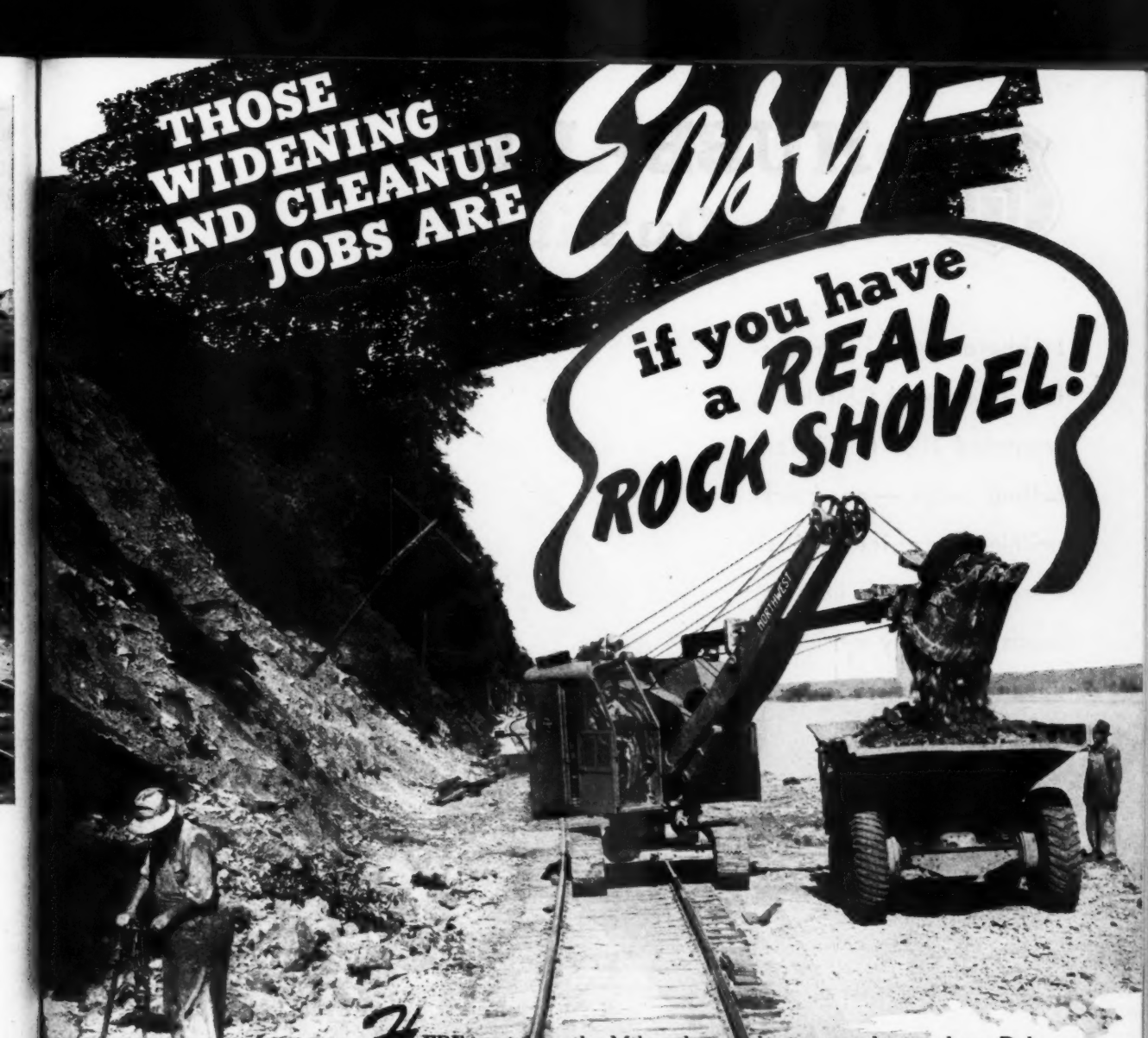
Over Twenty-five Years of Weed Control Service

CHIPMAN CHEMICAL COMPANY, Inc.

Chicago, Ill. · BOUND BROOK, NEW JERSEY · Portland, Ore.
Houston, Texas · Palo Alto, Calif. · No. Kansas City, Mo. · Winnipeg, Man.

THOSE WIDENING AND CLEANUP JOBS ARE *Easy*

if you have a REAL ROCK SHOVEL!



HERE is a job on the Milwaukee, widening a rocky cut above Dubuque, Iowa. The work train has unloaded the Northwest and cleared the line.

These are easy jobs for a Northwest. With its Dual Independent Crowd it handles rocky going like this and maintains high output seemingly without effort. Long reach reduces moving and keeps hauling equipment back from the line which, combined with Northwest steering allows the machine to clear the line quickly.

Extra long dipper sticks permit working from a standard flatcar when desired. Here's a machine that does things no track type machine can do.

Let us send you further details. There is a size for every excavating and material handling problem.

NORTHWEST ENGINEERING COMPANY
1713 Steger Building • 28 East Jackson Boulevard
Chicago 4, Illinois

NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

HUBBARD
For Quality

Hubbard Special Slim Pattern Alloy Track Chisels are tempered 2½" to 3" from cutting edge — no blacksmithing required—just sharpen when dull; likewise, heads need only regrinding when mushroomed.

Hubbard SUPERSTEEL Alloy Double Face Sledges and Striking Hammers as well as Spike Mauls—in fact all Hubbard Track Tools are made to the AREA specification. Faces are ground to 45 degree bevel to prevent shearing or accidents from flying pieces.

Hubbard & Company manufacture a complete line of SUPERSTEEL Alloy and High Carbon Steel Track Tools, Alloy Spring Washers and the Unit Rail Anchor.

New York Office	**HUBBARD and COMPANY**	*Chicago Office*
3712 Woolworth Bldg.	**Tool Division**	Room 924
233 Broadway	*Manufacturers of Alloy Spring Washers & Rail Anchors*	332 S. Michigan Ave.
New York (7), N.Y.	6301 Butler Street	Chicago (4), Ill.
	Pittsburgh (1), Pennsylvania	

This tower demonstrates how you can have the safety and work-speeding features of elevated flood-lighting in classification yards and terminals . . . and at the same time avoid high first cost and excessive maintenance expense.

It was built of pressure-treated wood by railroad workmen, was speedily erected, and requires no painting. First cost was low, maintenance should be nil because it is protected against decay or termite attack, and if at any time changing conditions make relocation desirable, the tower can easily be taken down and erected elsewhere.

Structural members for towers can be pre-formed in your shops and sent to us for treatment . . . or pre-formed to your blueprints in our own shops prior to treatment.

Floodlight towers are only one of the diversified applications of pressure-treated wood in the railroad field. A number of others are pictured in our bulletin, "Economical and Permanent Construction with Pressure-Treated Wood." We will gladly send you a copy.

KOPPERS COMPANY, INC.—WOOD PRESERVING DIVISION

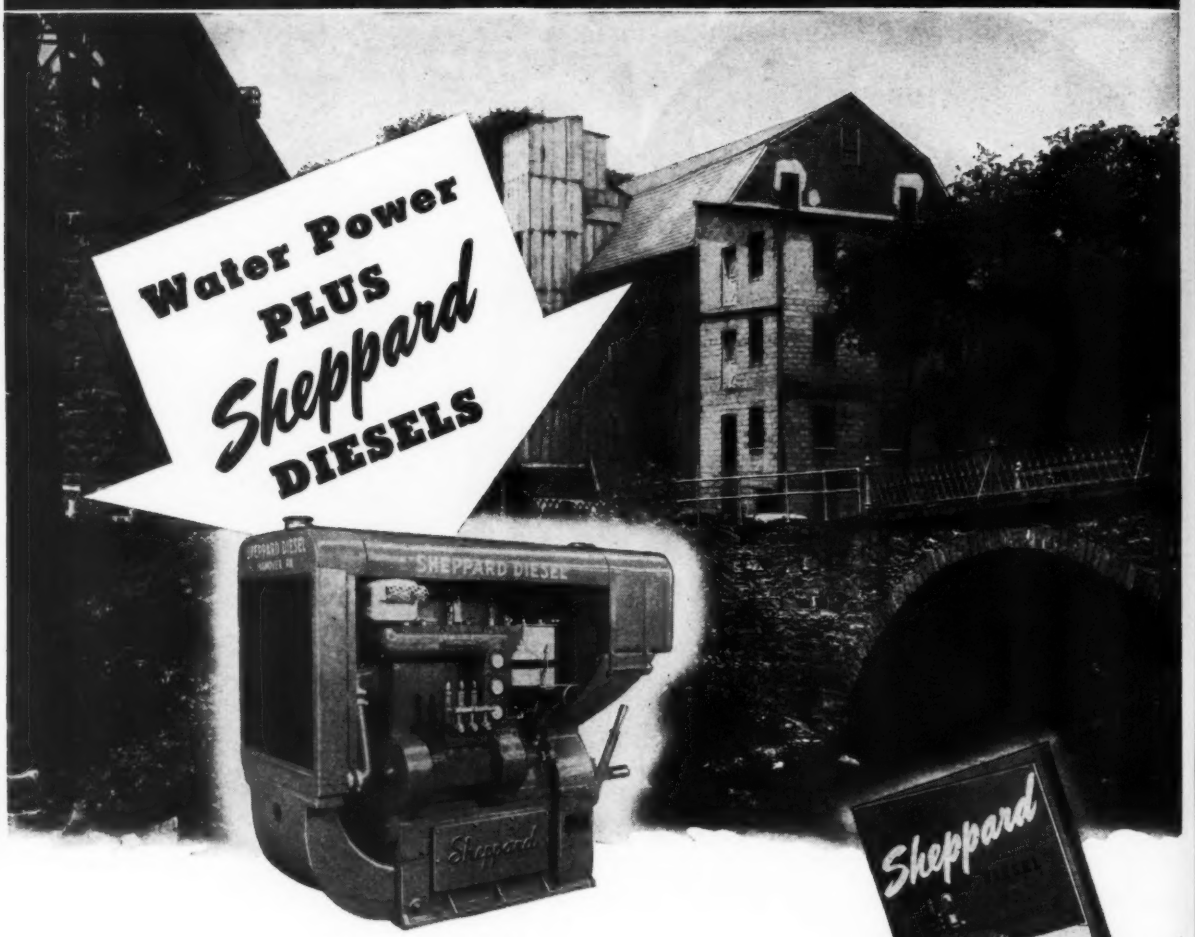
PITTSBURGH 19, PA.

KOPPERS

Buy War Bonds—
and Keep Them!

THE INDUSTRY THAT SERVES ALL INDUSTRY

GRAPHITE MILL USES WORLD'S THRIFTIEST POWER COMBINATION

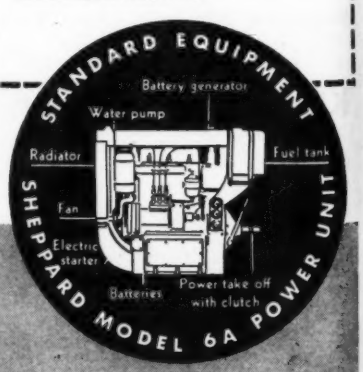


WATER POWER is economical . . . but unreliable. This graphite mill supplements water power with four Model 6 Sheppard Diesels which take over when water level falls or the stream freezes up. The combination feeds a steady supply of low cost power to the mill's machinery at all times. Despite the severe service conditions created by the constant presence of graphite dust, the Sheppard Diesels are always "ready to go."

Complete dependability and readiness to go into action at any minute are assured by Sheppard Diesel's oil cooled pistons...hardened, replaceable cylinder liners . . . 4% governor regulation . . . simplified fuel injection system.

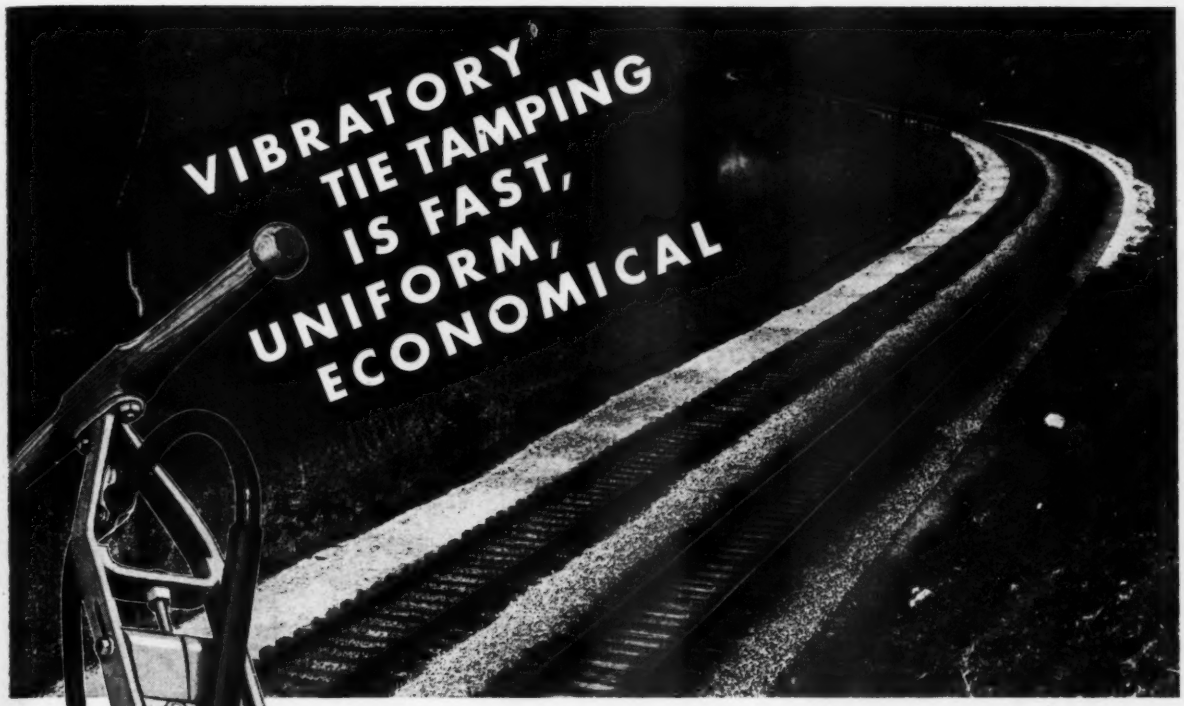
If you want to learn how low in cost dependable power can be, learn about Sheppard Diesels. Some of these engines are now available on priority to essential industries. Sheppard engineers will be glad to make recommendations suited to your present or post-priority needs. Write today, stating your requirements.

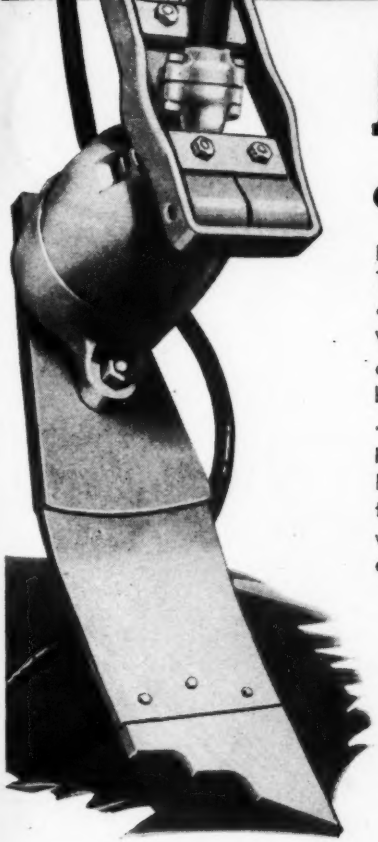
SHOWS WAY TO CUT GENERATING COSTS. Handy, file-size folder . . . just published . . . gives valuable information about Sheppard Diesel Generating sets. Compact . . . time-saving . . . no pages to leaf through ! Quantity is limited . . . so write for your copy today.



R. H. SHEPPARD COMPANY, HANOVER, PA.

Sheppard
ALL AMERICAN DIESELS





JACKSON *Tampers*

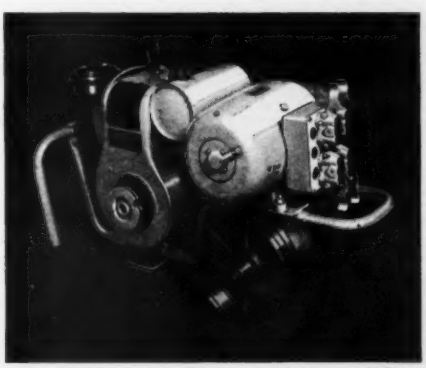
and PORTABLE POWER PLANTS

HAVE LONG BEEN STANDARD TRACK MAINTENANCE EQUIPMENT ON THE MAJORITY OF AMERICAN RAILROADS. Their superiority lies in the adaptation of vibration to ballast tamping, a principle originated by JACKSON.

Whatever the lift or nature of the ballast, ***vibratory*** tamping provides a closely-fitted, interlocking ballast pattern, with a minimum of voids between ballast particles. ***Vibratory*** tamping assures sound track and good drainage. . . . Fitting ballast, rather than crushing it, is the JACKSON ***vibratory*** tamping principle.

Procurement officials confronted with the task of preparing smooth riding, safe track for post-war high-speed passenger traffic, and heavy swift-moving freight, will find it to their advantage to investigate JACKSON ***vibratory*** tamping equipment and methods.

JACKSON Tampers with interchangeable blades, operated by a JACKSON Portable Power Plant, can be used with any sized gangs in all ballasts and lifts. Tamper illustrated with Step-Cut blade. Adapted to wide range of use.



ELECTRIC TAMPER & EQUIPMENT CO.

LUDINGTON · · · MICHIGAN

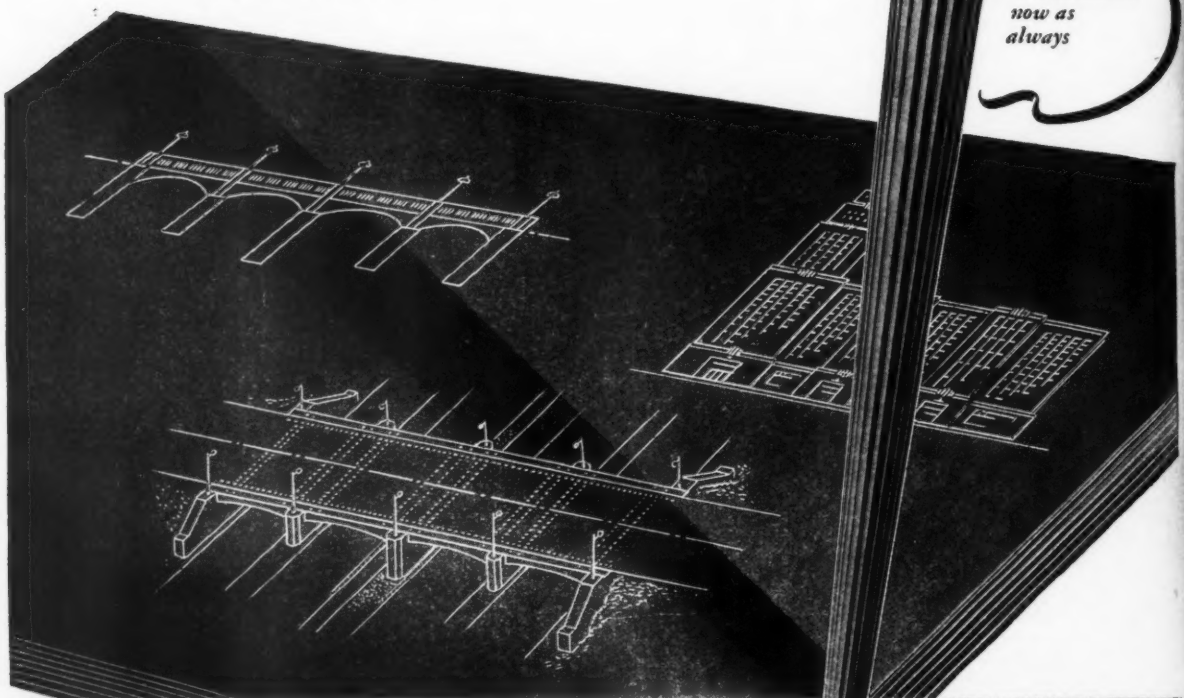
Put Your Postwar Projects on a Sound Basis

... WITH MONOTUBES

PROVED ON TOUGH FOUNDATION JOBS ALL OVER AMERICA

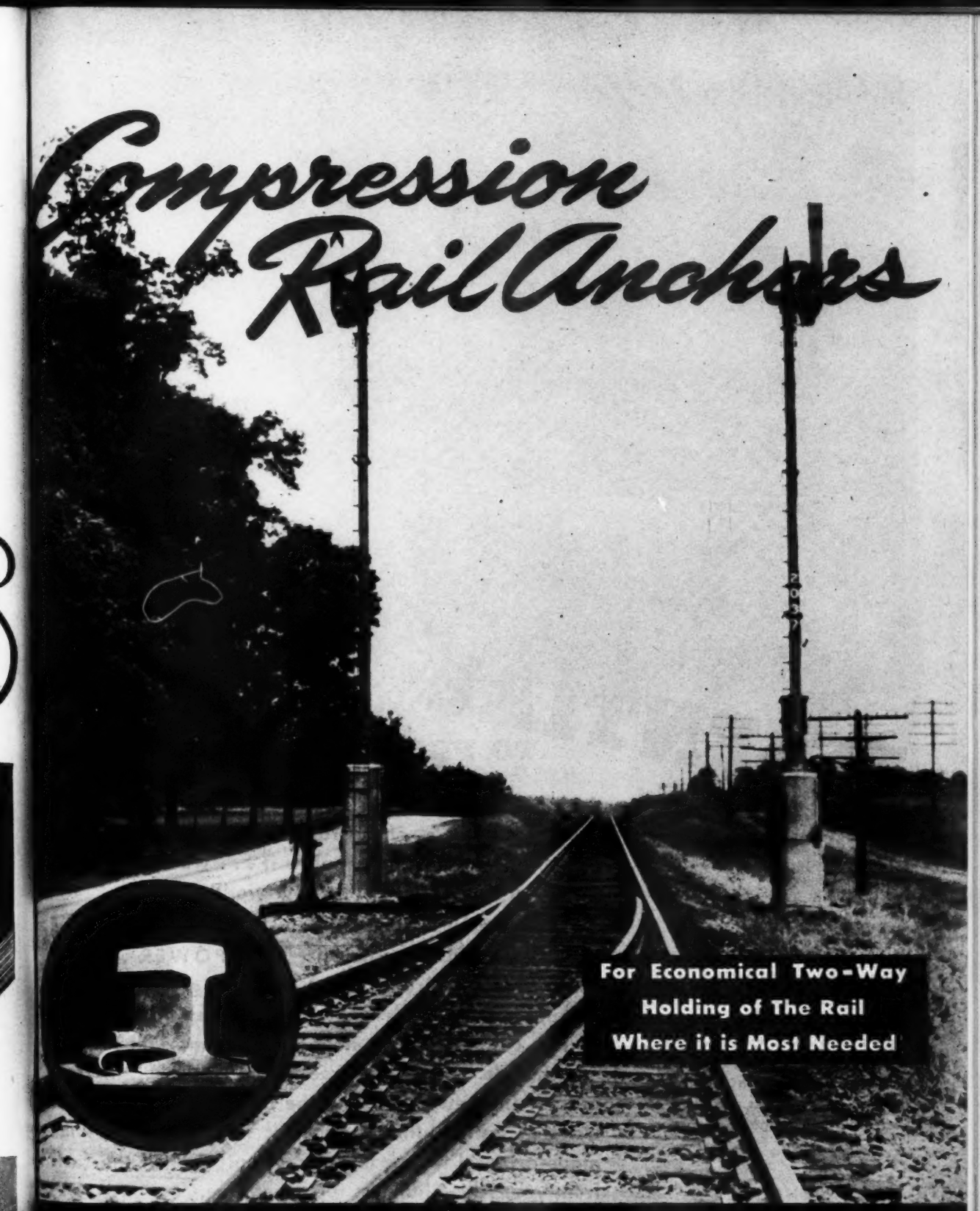
NORTH, East, South, West—wherever there's a tough foundation job experienced engineers and contractors use Monotubes. Why? Because when you want foundations in ahead of schedule—Monotube tapered piles speed and simplify your work. Their lightness makes them easier to handle; permits faster driving with average job equipment. Their tubular design permits quick, sure inspection before concreting. And, best of all, Monotubes can be readily extended on the job to meet varying conditions. Available in gauge, size, and taper to meet all requirements. Ask for Catalog 68A. Write The Union Metal Manufacturing Company, Canton 5, Ohio.

Services of our engineers are available now as always



UNION METAL

Monotube Tapered Piles

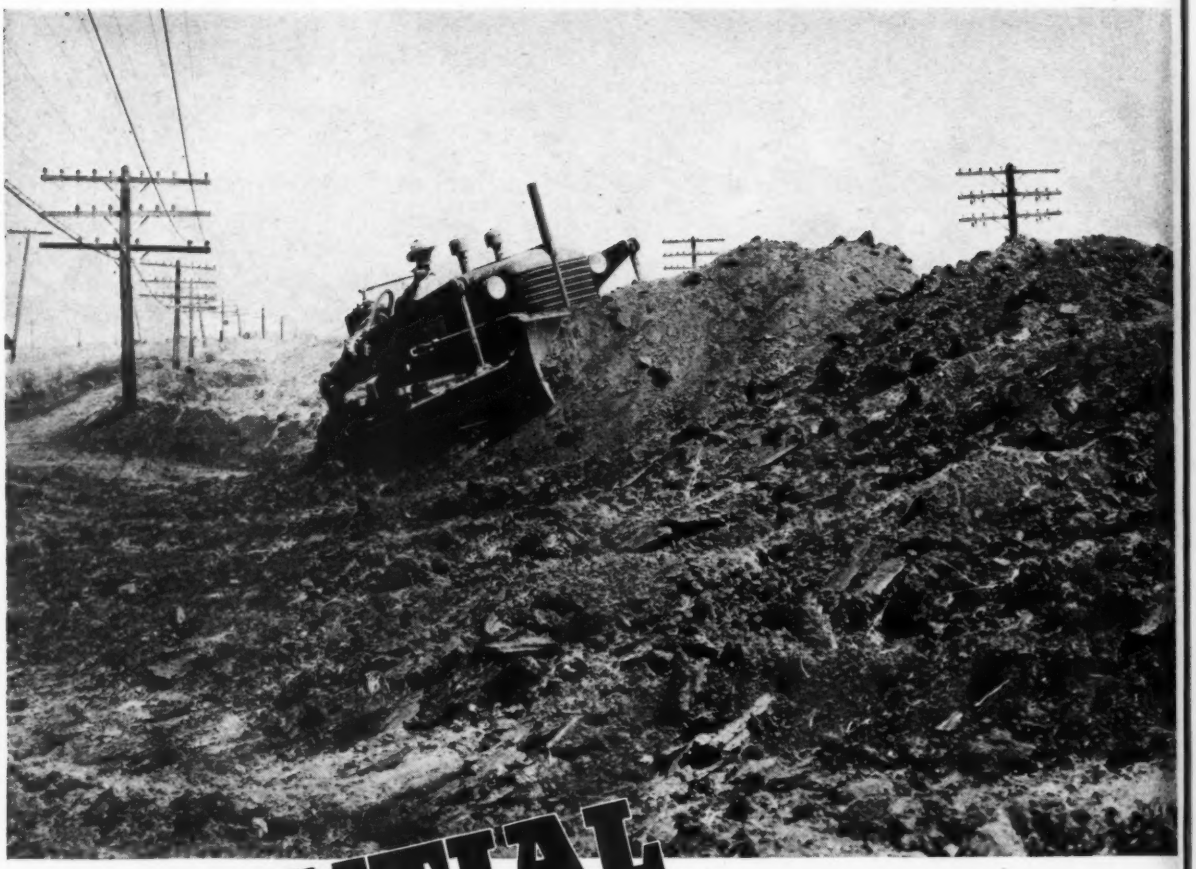


THE RAILS COMPANY

General Office

178 GOFFE STREET, NEW HAVEN 11, CONN.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.



ESSENTIAL TO PROFITABLE OPERATION

Streamline service calls for streamline maintenance! Use fast, versatile 2-cycle Diesel tractors with bulldozers and scrapers for building up road beds, widening banks and cutting drainage ditches. No interference with traffic, no danger of accidents, no limit to their ability or range of operation.

To meet postwar competition . . . change to new, short-cut methods of operation. There's no returning to normal as we once knew it . . . we are headed toward a *new normal* . . . a *new* world.

Be ready! In many ways modern, 2-cycle Diesel tractors can help. For here is NEW POWER . . . fast-moving, economical, smooth-operating! These units will handle right-of-way and track bed maintenance at less cost, safely . . . at the same time, keep trains on schedule. They work free of the tracks . . . fit right in with the new tempo . . . the new tools . . . the new ways of getting things done. It is 2-CYCLE . . . the modern Diesel for modern operation. Get all the facts from your Allis-Chalmers representative.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Build up Worn Rail and Trackwork
by OXWELD'S Method

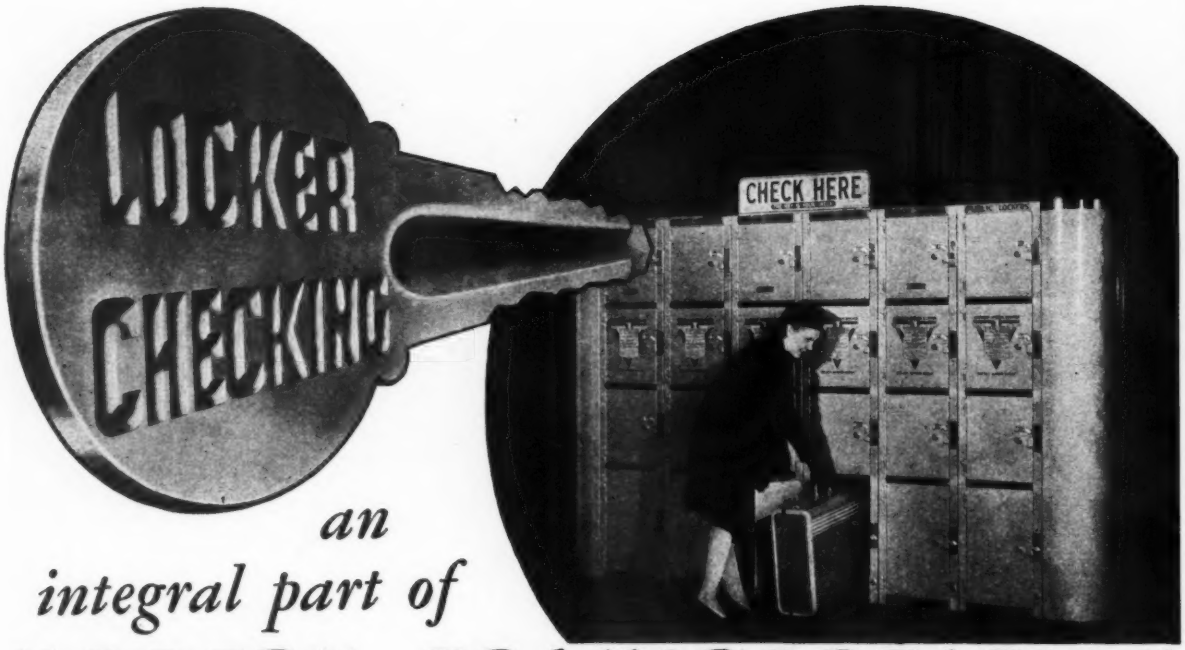
• Battered rail and trackwork can be economically restored to serviceable condition by Oxweld's rebuilding procedures. The cost of rebuilding amounts to only a fraction of the expense of new units, and the true riding surface so obtained results in smoother handling of freight, greater passenger comfort, and reduced wear on ties, joint bars, bolts, and rolling stock.

Use of OXWELD MW welding rod speeds rebuilding work and provides a surface that is more batter-resistant than the original rail metal. Careful performance of the operation under Oxweld's procedures assures proper alignment and permits the rebuilt areas to be finished to the proper surface with a minimum of grinding. Ask an Oxweld representative for further information.

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
Carbide and Carbon Building Chicago and New York

SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

The word "Oxweld" is a registered trade-mark.



an integral part of

MODERN TRANSPORTATION

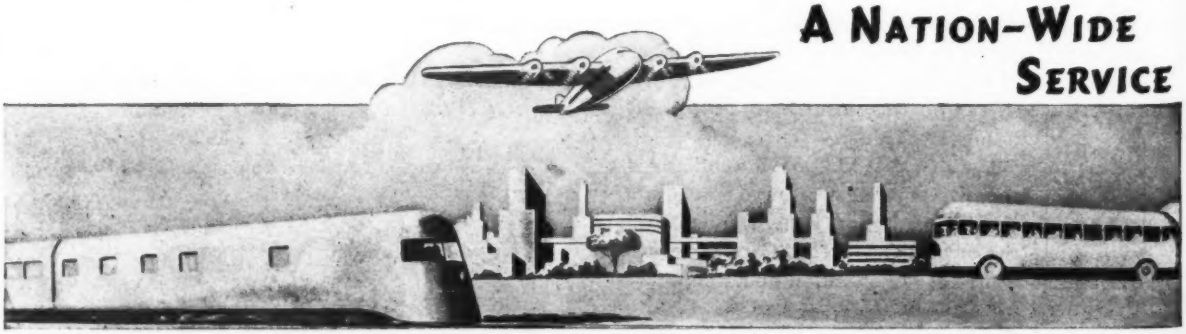
As the *key* to the lock . . . as the *lock* to the locker . . . so is the modern *parcel locker* to streamlined transportation! They fit. They go together. Self-service parcel lockers add to the sum total of good will and appreciation which the travel-wise traveler of today has for the marvelous service of the transportation companies. He looks for this convenient, safe, time-saving service wherever he stops for an hour or a day . . . it's the modern way and the key is his check. . . . no waiting in line. . . . our consultants are ready to confer with you immediately without obligation regarding the installation of lockers, or their inclusion in your plans for renovation or new building. May we make a survey and draw up recommendations on this same no-obligation basis?

AMERICAN LOCKER COMPANY, Inc.

211 CONGRESS ST., BOSTON 10, MASS.

BOSTON NEW YORK PHILADELPHIA PITTSBURGH
ATLANTA CLEVELAND CHICAGO DALLAS LOS ANGELES

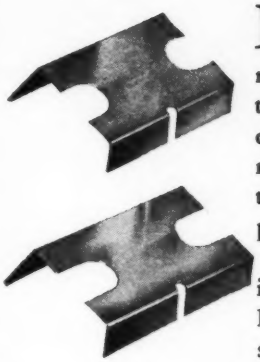
A NATION-WIDE SERVICE



TRAVEL-WISE TRAVELERS LOOK FOR PARCEL LOCKERS FIRST

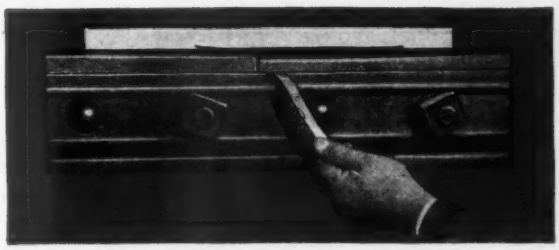
Complete Restoration of Worn Joint Bars to Original Efficiency by Improved

TELEWELD SHIMS

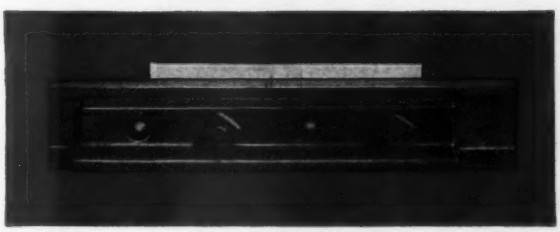


IT'S only common sense, when worn joint bars need restoring, to restore them completely to their original efficiency. Half measures are expensive in time, man-power, cost and performance.

That is why use of the new improved Teleweld Joint Bar Shim is an unsurpassed shimming method. Teleweld shims, designed for combined application to both top and bottom surfaces of the joint bar, compensate simultaneously for both the visible wear on top and the less visible wear but equally damaging wear at the base of the bar. They level up drooped rail ends and restore original bolt take up. When once installed, it is impossible for a Teleweld Shim to move or get out of position . . . or to produce a cocked joint. Bar vibration is reduced to the minimum, resulting in improved joint condition, lesser joint maintenance and the elimination of bond wire breakage. The possibility of joint bar freezing is lessened and track bolt maintenance is reduced to a minimum.



Worn Joint Bar before application of Teleweld Shim.



Worn Joint Bar AFTER application of Teleweld Shim. Notice wear is corrected and level completely restored.

The cost of installing the new Teleweld Shim is approximately one-fourth that of reforming or rebuilding joint bars. It is applied quickly by unskilled labor. Two sizes—½ inch and 3/4 inch—fit all weights of rail and types of bars. Test at our expense this unique, low-cost method of correcting joint bar wear. Write us on your letterhead, giving weight of rail type or section, and name of mill, and we will send you one set each of the Teleweld Shim without charge.

TELEWELD, INC.

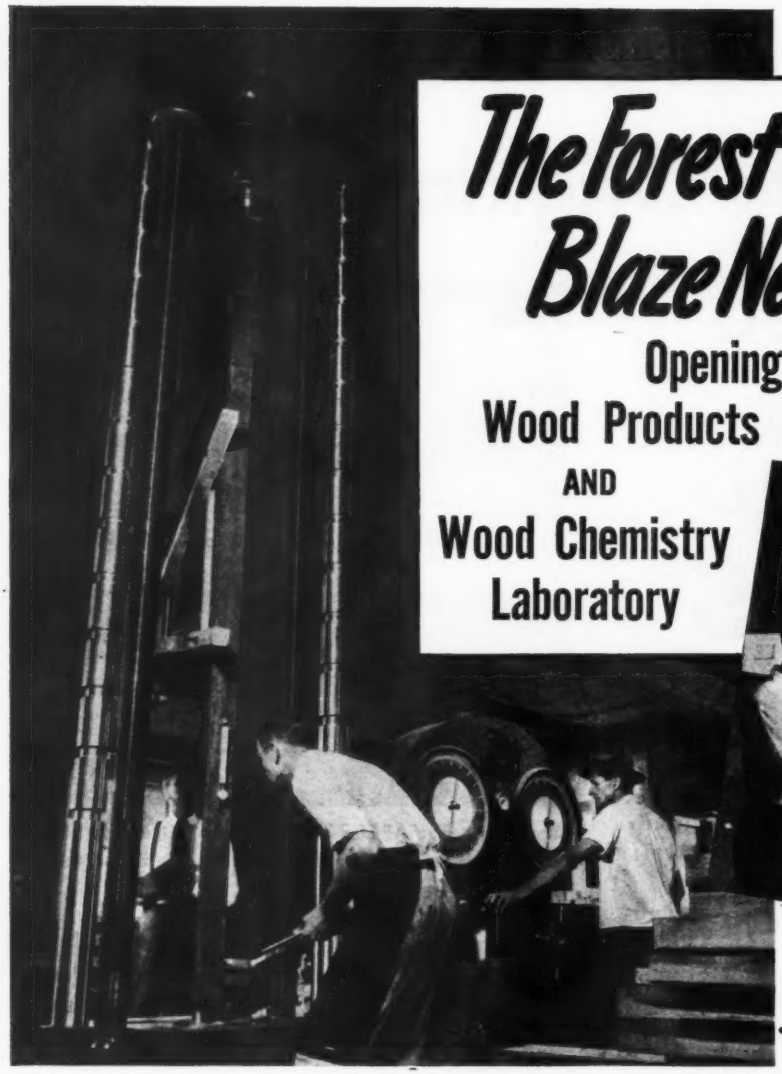
RAILWAY EXCHANGE BUILDING • CHICAGO, ILL.

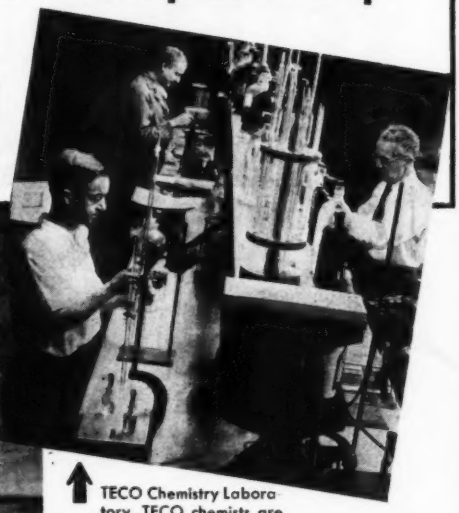
TELEWELD

New York • Cleveland • Salt Lake City • Boise • San Antonio • San Francisco • Washington • Los Angeles

The Forest Industries Blaze New Trails

Opening of TECO Wood Products Development Shop AND Wood Chemistry Laboratory





TECO Chemistry Laboratory. TECO chemists are here shown working on lignin derivatives.

200,000 lb. Baldwin-Southwark testing machine in the TECO Shop. Material undergoing test is a small wood column being tested in compression.

Timber Engineering Company announces the opening of its Wood Products Development Shop and Wood Chemistry Laboratory located in Washington, D. C.

The Wood Products Deveolpment Shop has a full scale testing rig equipped to handle trusses up to 50′ span; auto-claves and other equipment used in pressure treating; dry kiln and high pressure steam equipment for impregnating; and other facilities for determining the physical and mechanical properties of wood and wood products.

The Wood Chemical Laboratory has modern equipment for investigations in wood chemistry and wood derivatives research. It is giving special attention to lignin research including adhesives, synthetic plastics, etc.

If you have any problems in respect to the physical, mechanical and chemical properties of wood, the technical staff of the Timber Engineering Company may be of assistance on a moderate fee basis. If its own facilities will not solve your problem, it will assist you in locating sources which can.

Consultations at our Washington office may be made by appointment and without obligation on your part. Write us on your business letterhead stating your wood utilization problem.

TIMBER ENGINEERING COMPANY OF WASHINGTON, D. C.

WASHINGTON • CHICAGO • MINNEAPOLIS • NEW ORLEANS • SAN FRANCISCO

Specify **TECO**

CONNECTORS AND TOOLS

Endorsed by Leading Lumber Manufacturers and Fabricators

FOREIGN DISTRIBUTORS:

V. H. McIntyre, Ltd., Toronto, Canada • MacAndrews & Forbes, Ltd., London, England • Timber Engineering Company, Sydney, Australia Murie & Company, Ltd., Wellington, New Zealand • The Ford Company, Inc., Panama City, Panama • Standard Machinery & Supply Company, Mexico, D. F.

A 25,000-Gallon Drink . . .

Quick!

LOCOMOTIVE 4007 is thirsty with a thirst that only 25,000 gallons of water can quench. A Fairbanks-Morse 12A Sheffield Standpipe does the job with the speed, efficiency and convenience demanded by today's railroading.

The Sheffield 12A has a telescopic spout that gives wide lateral and vertical range . . . convenient levers that permit rotation from ground or tender . . . operating rods that are easily adjustable . . . springs that eliminate shock . . . large roller that steadies spout . . . all rods outside of pipe, to provide easy adjustment.

In addition, this standpipe automatically locks from ground or tender . . . has no cable sheaves to clog with ice . . . rotates easily. Made in 8", 10", and 12" sizes, with capacities up to 6,000 g.p.m.

Since 1880 Fairbanks-Morse has supplied railroads with standpipes that are reliable, safe, and economical. Today this equipment is helping railroads meet the biggest schedule in their history.

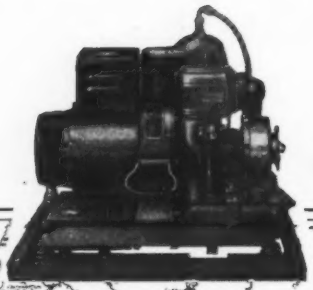
Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois
Canadian Fairbanks-Morse Co., Ltd., Montreal

FAIRBANKS-MORSE

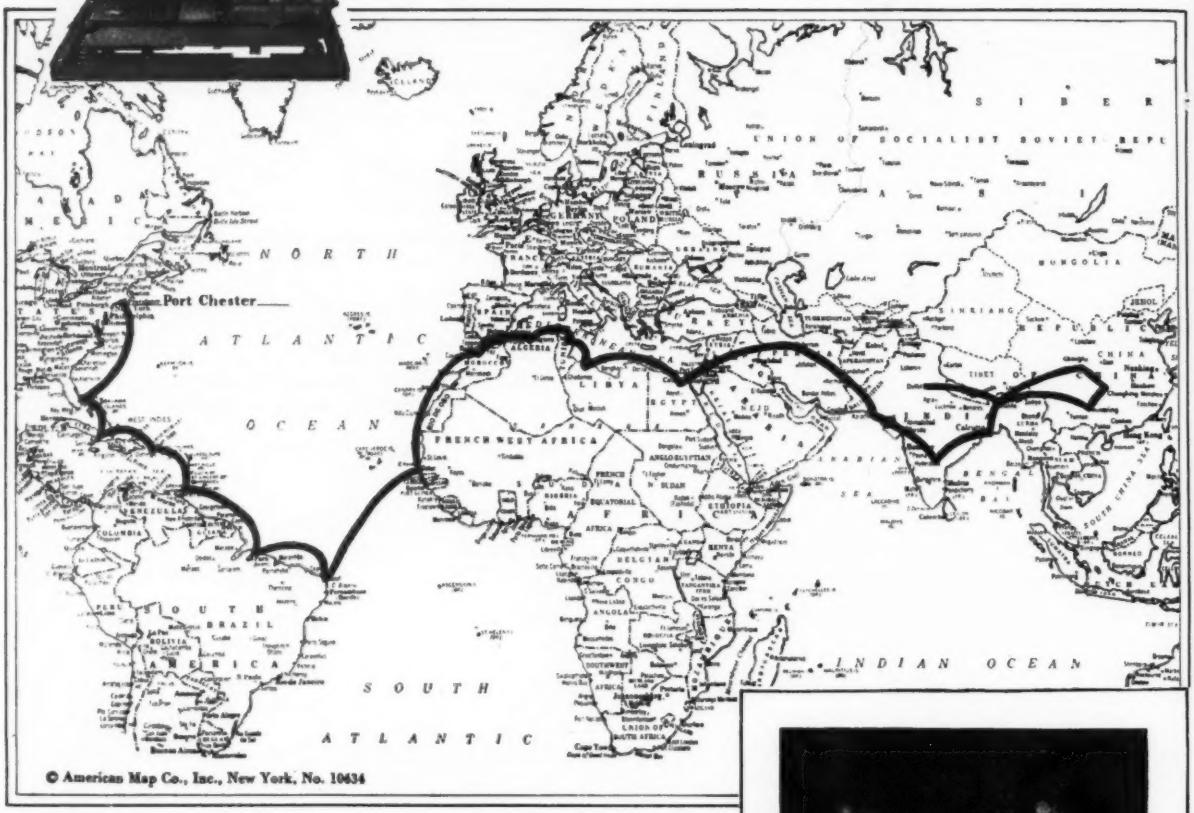
DIESEL LOCOMOTIVES • DIESEL ENGINES • MOTORS • GENERATORS
SCALES • PUMPS • STOKERS
RAILROAD AND FARM EQUIPMENT

Railway Equipment

BUY WAR BONDS



HERE'S A TRIP
that will do you a Lot of Good



From Port Chester, New York, to Chungking, China . . . with plenty of stops in between.

Just one trip of many . . . made by a Homelite service man . . . to get facts . . . to find out how Homelite Portable Generators are performing and standing up under the tough conditions of war.

On trips like these . . . to Alaska, Africa, India and all the theatres of war, Homelite men get the "dope" first hand. And they transmit their information back to our engineering department where new advancements in design and performance are constantly being made to meet the pace.

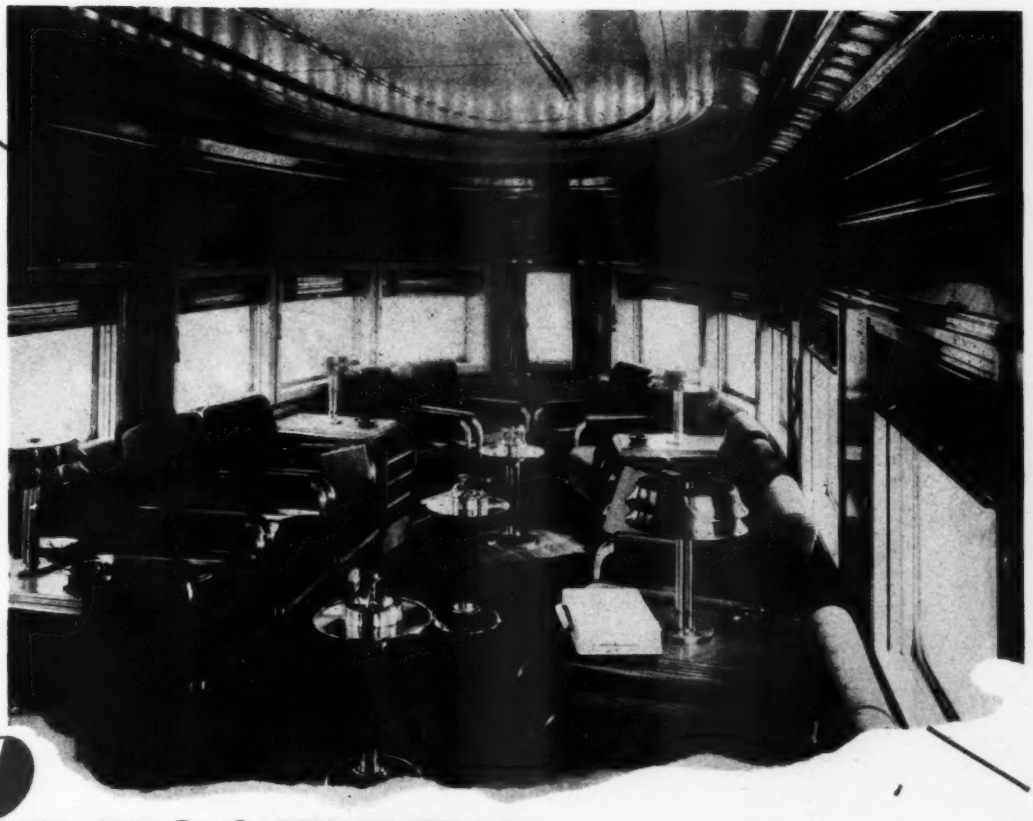
Yes, trips like these will do you a lot of good. For they have piled up a wealth of priceless experience that will enable us to give you better generators, better pumps and better blowers, than you ever had before.

THE BENEFITS FOR YOU

Better cold weather operation . . . better hot weather operation . . . new cooling methods . . . advanced type bearings . . . less trouble and maintenance . . . much longer wear . . . more power . . . more portability . . . these and many other features will be but standard advantages of the New Homelite Gasoline-engine-driven Generators, Pumps and Blowers that you will get and use, after the war is over.

HOMELITE CORPORATION
PORT CHESTER, NEW YORK

PORTABLE PUMPS • GENERATORS • BLOWERS



PRESSTITE Sealers and Adhesives Assure Better, More Economical Car Construction and Maintenance

There are many highly specialized Presstite Sealing Compounds that meet various railway construction and maintenance demands. Presstite sealers and adhesives are easy to apply, stand up under extremes of heat and cold and have been thoroughly proven in test and service.

A few of the many Presstite products for railway use include:

- **Presstico No. 500, Adhesive Felt Tape.**
  For anti-squeak uses and insulation between metals.
- **Presstico No. 504 and No. 505, Impregnated Adhesive Felt Packing.**
- **Presstico No. 23212 Extruded Glass Sealer Tape.**
  A better, long-lasting, flexible seal for car windows. In tape or ribbon form, in thicknesses and widths to meet your requirements.
- **Presstico Spot Weld Sealer.**
  Produced in flow-gun, brush, or spray types. Non-corrosive to metals and prevents rust. For tightly sealing any spot welded seam.
- **Presstico No. 2390 Asphalt Waterproofing Mastic.**
  For preventing rust and corrosion of railroad equipment.

If you have a problem involving adhesive or sealing compounds for railway application, or if you are looking for an improved method of doing your present sealing jobs, send your requirements to Presstite. Our engineers will gladly work with you in producing the correct formula for your particular needs.

PRESSTITE

5000 HOURS ON THE JOB! REPAIR COST—ZERO!

Thor

PNEUMATIC ROTARY GRINDERS

Independent Pneumatic Tool Company,
1740 East 12th St.,
Cleveland, Ohio.

Gentlemen:-

We believe you will be interested to know that we have now in service some eighteen No.360-G THOR Rotary Pneumatic Grinders, Model #5291.

Eight of these grinders have been clamped in a horizontal position, in various locations in the shop, for grinding purposes, where the work is brought to the grinder.

These grinders have been in use, for over a period of one year - have never been taken apart, but did receive lubrication daily, grease in the bearings and oil in the oil reservoir for lubricating of the blades and revolving rotor. We estimate 5,000 hours operation.

The enclosed are the original four blades from one of these grinders, as evidence of the small amount of wear on these blades. You have our permission to use these, as a testimony. THOR tools have given better results with less maintenance cost than any similar tools used in our shops.

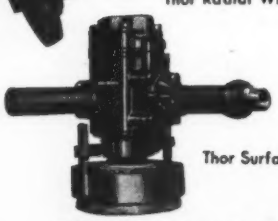
Very truly yours,

*Name furnished on request

A SIZE AND STYLE FOR EVERY JOB

Thor Small Wheel Grinders

Thor Radial Wheel Grinders



Thor Surface Grinders

50 Thor Air Grinders!

LOOK AT THE RANGE!

Number of Models 50
Wheel Capacities . . . 1-½" to 8" dia.
Speeds ..... 3000 to 21,000 r.p.m.
Lengths ..... 5-½" to 39"
Weights ..... 18 oz. to 24 lbs.

FREE INFORMATION

Write today for complete details about Thor Grinders and other Thor Air Tools in Catalog 52-B.

Thor *Portable Pneumatic and Electric Tools*

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

American

MATERIALS HANDLING FOR RAILROADS

THE *American* LOCOMOTIVE CRANE

The AMERICAN Locomotive Crane was designed for variety of materials handling work. Scattered over the country with the nation's leading railroads, their mobility, ease of operation, simplicity of control, have demonstrated that they are an efficient materials handling method for bucket, magnet, and hook work. They make the use of old machines and other methods costly and wasteful by comparison.

Under your jurisdiction is materials handling that can be done better with an AMERICAN Locomotive Crane. Now is the time to look into it.

4456

Plan now . . . but wait for **AMERICAN!**

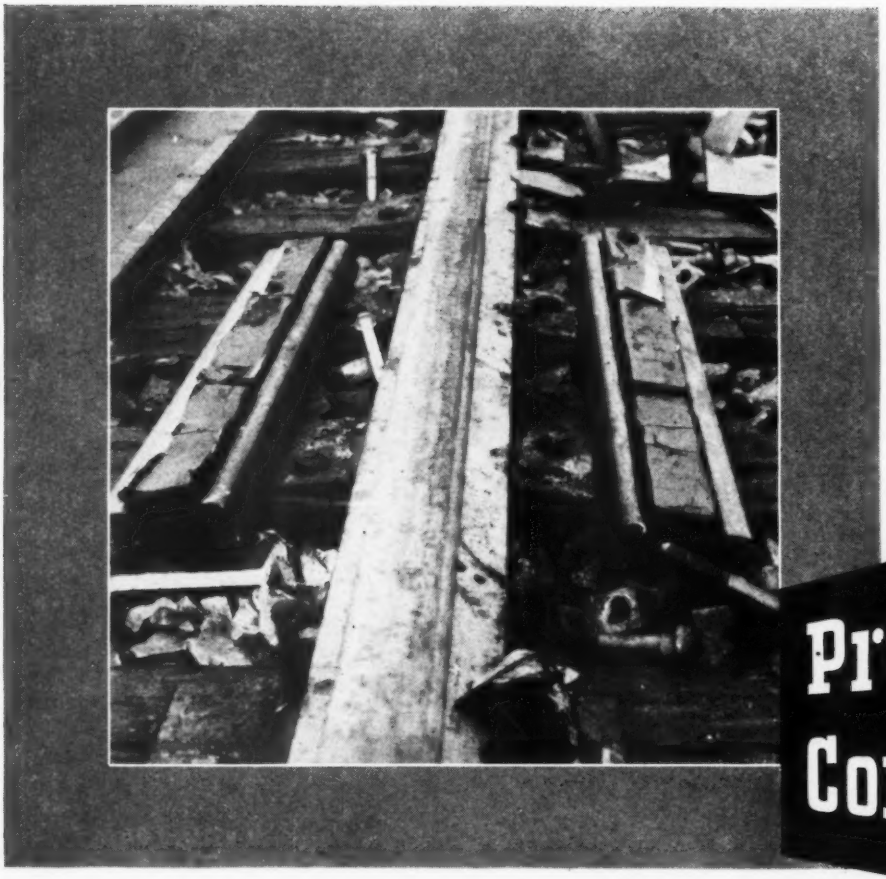
AMERICAN MATERIALS HANDLING *for* EVERY INDUSTRY

AMERICAN HOIST & DERRICK CO.

Saint Paul 1, Minnesota

CHICAGO SAN FRANCISCO NEW YORK

Wherever wire rope is fastened . . . use genuine **CROSBY CLIPS** *with the Red-U-Bolt*

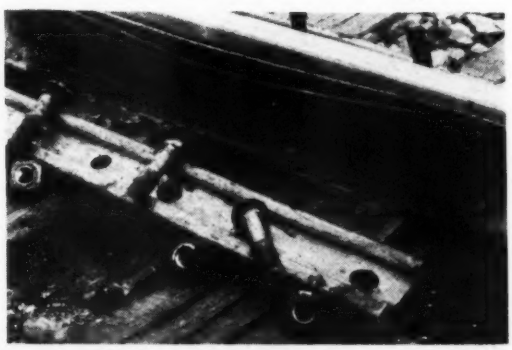


Prevent Corrosion

by Applying RMC PACKING to the Vital Rail Joint Areas

IMPORTANT

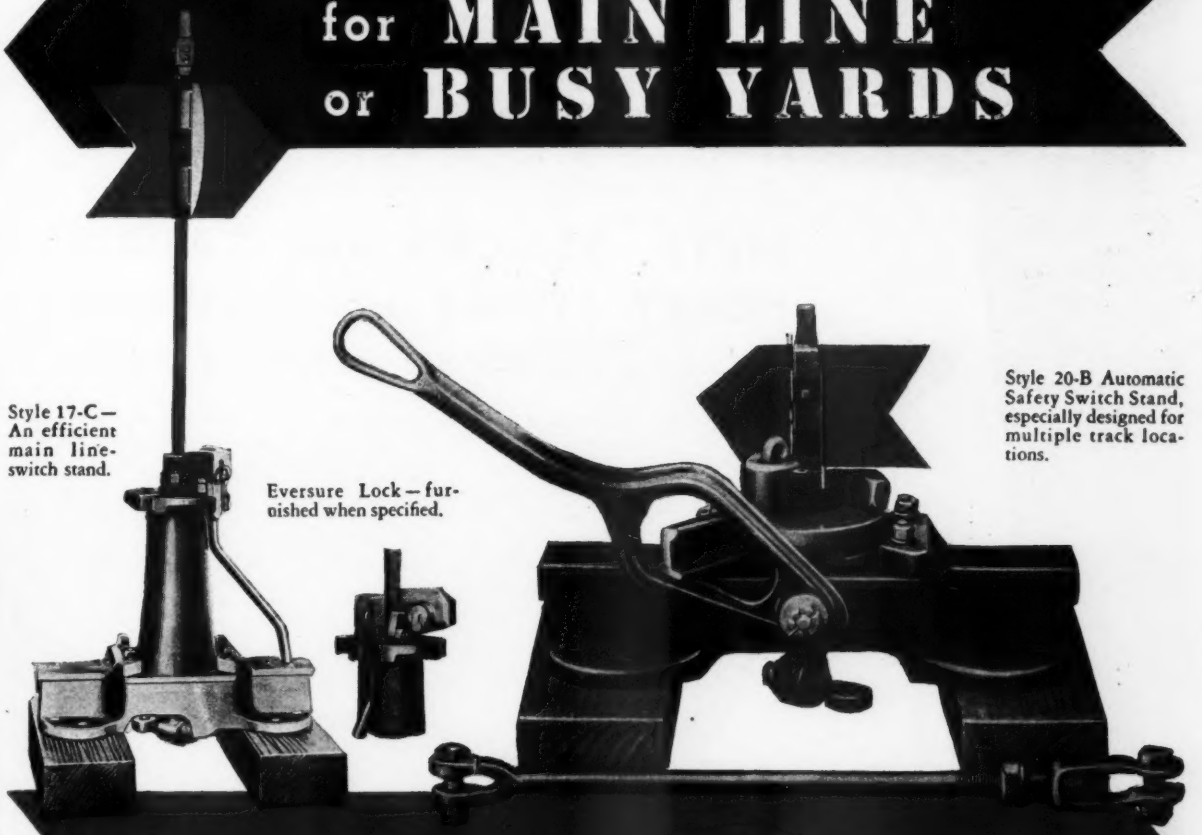
Order your RMC PACKING now so that it will be available when needed.



After five years' protection with RMC Packing the rail, joint bars, bolts and nuts of this joint were found completely free of corrosion.

RAILWAY MAINTENANCE CORP.
PITTSBURGH 30, PENNSYLVANIA

for MAIN LINE or BUSY YARDS



Style 17-C—An efficient main line-switch stand.

Eversure Lock—furnished when specified.

Style 20-B Automatic Safety Switch Stand, especially designed for multiple track locations.

there's a RACOR Automatic safety switch stand

Racor Automatic Safety Switch Stands all share the special Racor feature of being absolutely rigid for hand operation but always set for automatic action whether locked or not. If a train trails through, the switch is automatically thrown to the opposite position by the wheel flanges.

The 17-C Racor Automatic is recommended for main line tracks. The target has good visibility and the height is convenient for hand operation. Eversure lock can be furnished when specified, to eliminate padlocks.

The 20-B Automatic is recommended for multi-track locations, such as yards. The low target always indicates true position of the switch. This switch promotes economy by eliminating expensive repairs often caused when rigid stands are trailed. A hook or padlock may be applied in the locking eye after hand throw is completed.

Brake Shoe

8877

RAMAPO AJAX DIVISION · 230 PARK AVE., NEW YORK 17, N. Y.
HILLBURN, N. Y. · NIAGARA FALLS, N. Y. · CHICAGO, ILL.
EAST ST. LOUIS, ILL. · PUEBLO, COLO. · SUPERIOR, WIS.
LOS ANGELES, CAL. · SEATTLE, WASH. · NIAGARA FALLS, ONTARIO

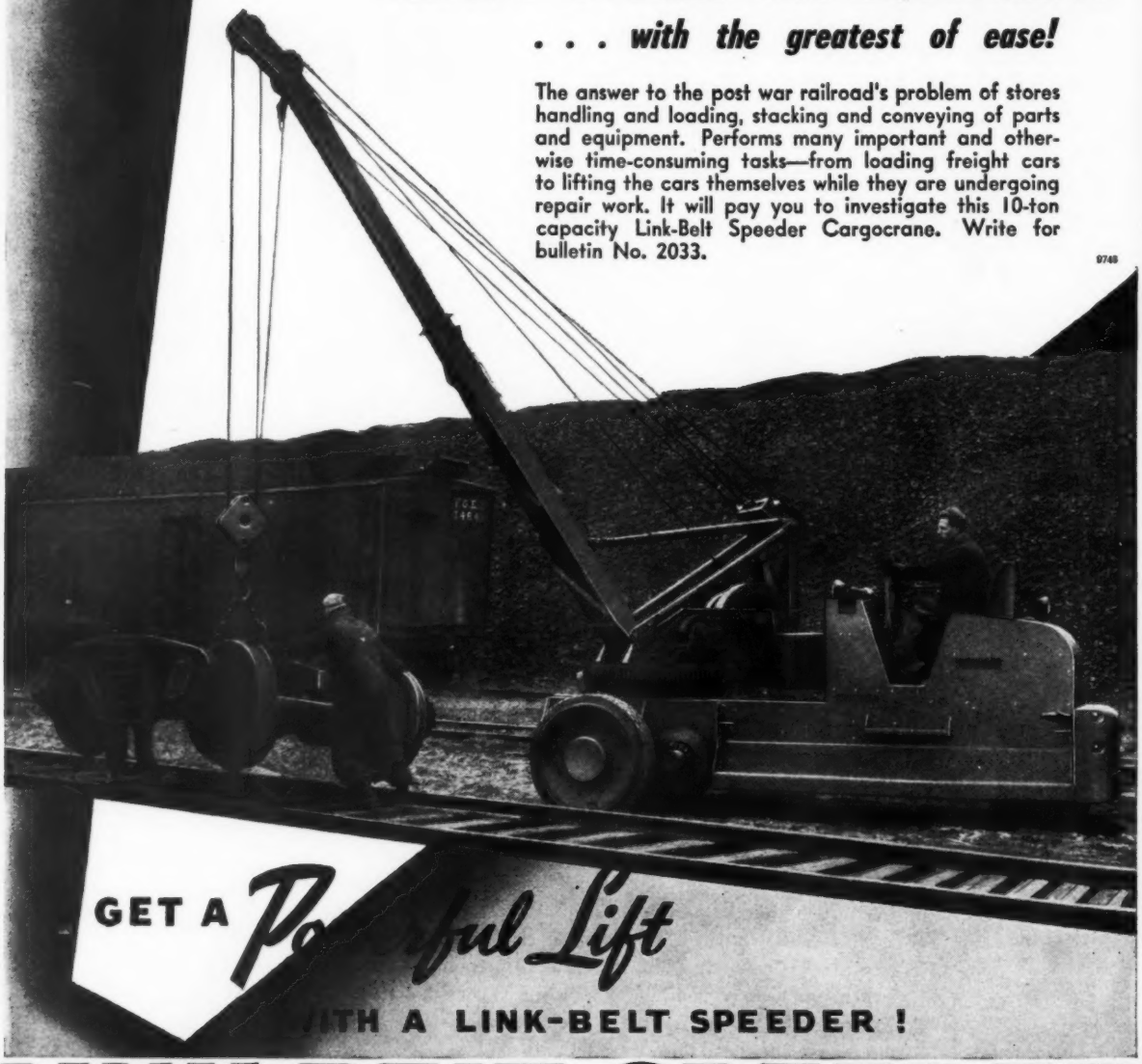
LINK-BELT SPEEDER CARGOCRANE

LIFTS, STACKS and CARRIES HEAVY STORES and EQUIPMENT

. . . with the greatest of ease!

The answer to the post war railroad's problem of stores handling and loading, stacking and conveying of parts and equipment. Performs many important and otherwise time-consuming tasks—from loading freight cars to lifting the cars themselves while they are undergoing repair work. It will pay you to investigate this 10-ton capacity Link-Belt Speeder Cargocrane. Write for bulletin No. 2033.

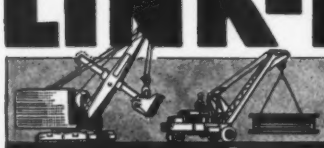
9748



GET A *Powerful Lift*

WITH A LINK-BELT SPEEDER !

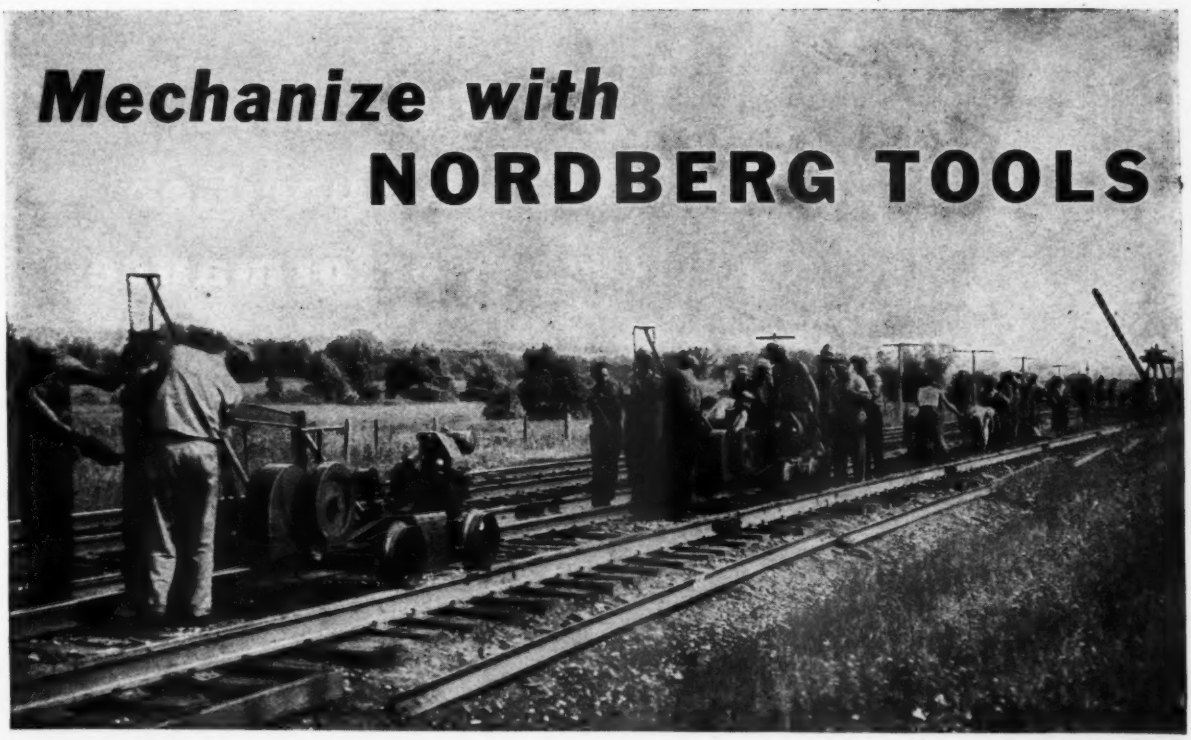
LINK-BELT SPEEDER



Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

Mechanize with NORDBERG TOOLS



Here Nordberg tools are pulling the spikes and adzing the ties. On this same job there are Nordberg Rail Drills and Power Wrenches.

For Greater Speed and Better Quality of Work

mechanize your rail laying and track maintenance gangs with Nordberg Power tools. These machines were developed in cooperation with maintenance men to enable you to improve the standard of your track work, to do it faster and at less expense. Today these machines are standard equipment on all leading railroads.

Maintain your track in keeping with wartime traffic demands by mechanizing every operation that can be done with a Nordberg power tool. Let us give you full particulars how these machines can be of service to you.

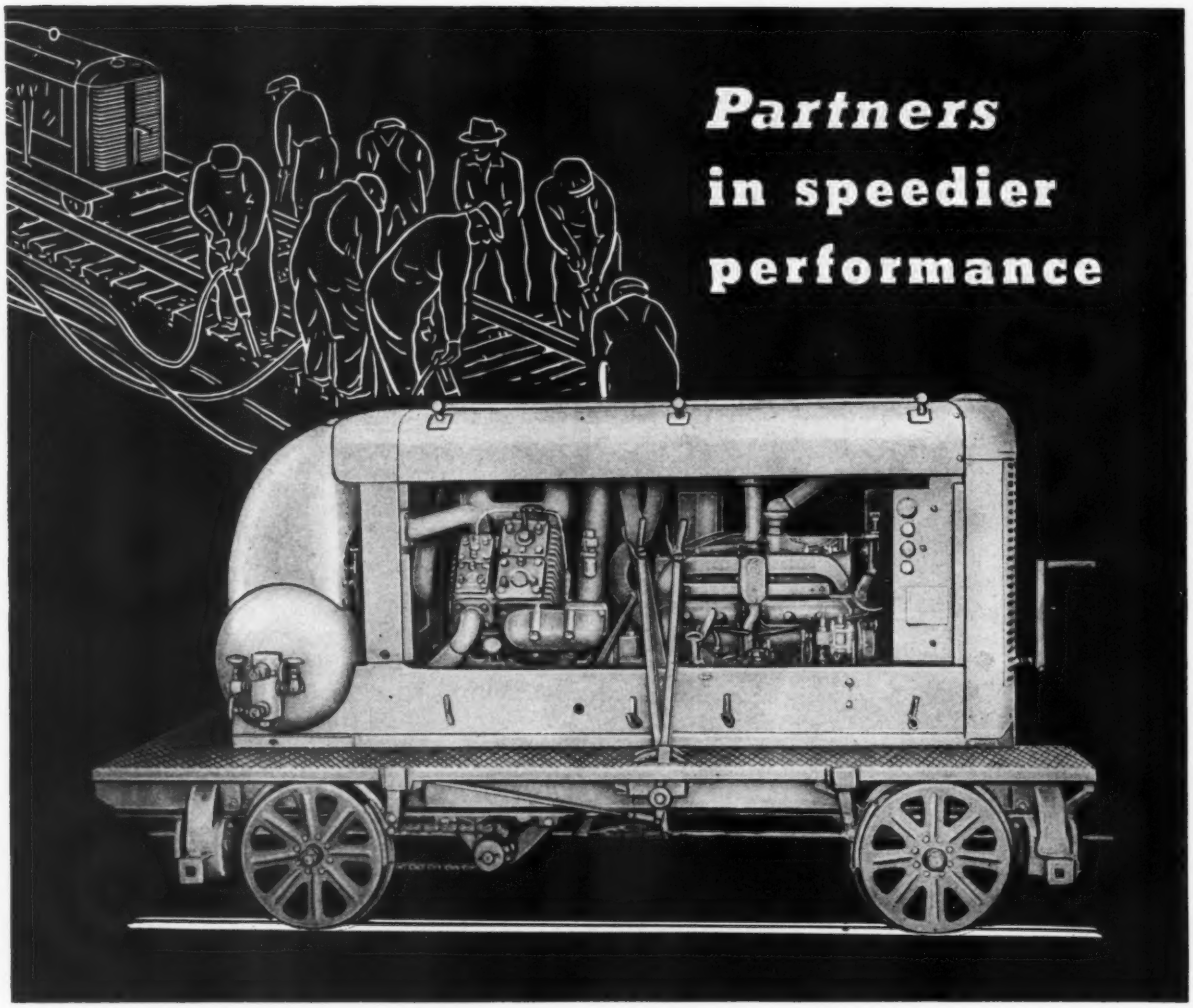
The Nordberg tools are for your maintenance jobs

Spike Puller
Adzing Machine
Rail Drill
Power Wrench
Rail Grinders
(Five types)
Power Jack
Track Shifter

NORDBERG MACHINERY

NORDBERG MFG. CO. MILWAUKEE WISCONSIN

Export Representative—WONHAM Inc.—44 Whitehall St., New York



CP Flanged-Wheel Compressors
CP Tie Tampers

REDUCE maintenance time and costs with CP Compressors and CP Tie Tampers! CP Two-Stage, Air-Cooled, Flanged-Wheel and other railroad mounted portable Compressors feature gradual speed regulator, varying the speed *gradually* up and down exactly with air demand. This and other design refinements produce a full-load performance of from 15% to 35% more air per gallon of fuel consumed.

CP Portable Compressors are available in gasoline driven or Diesel driven models in sizes ranging from 60 to 500 c.f.m. actual capacity. CP Tie Tampers, noted for their easy handling and low air consumption, enable you to make the most of compressor capacities. They are efficient in nipping and on small rises – also on jobs where the track is raised several inches. Write today for further information.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

PERFORMANCE

of Insulated Joints is Contingent Upon Proper Installation and Maintenance

View of Norfolk & Western Railroad

Install Carefully . . . Hand-wrench Bolts to Proper Tightness . . .
Support Joints Equally . . . Use Sound Ties . . . Keep Well Tamped

Insulated Joints Perform a Double Operating Service

—They unite the rail ends Mechanically—
—They separate the rail ends Electrically—

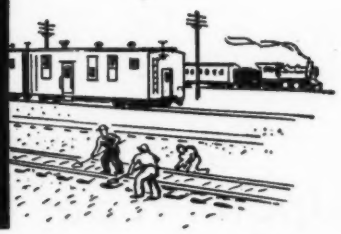
Continuous

Support the
6th WAR LOAN
Buy More Bonds

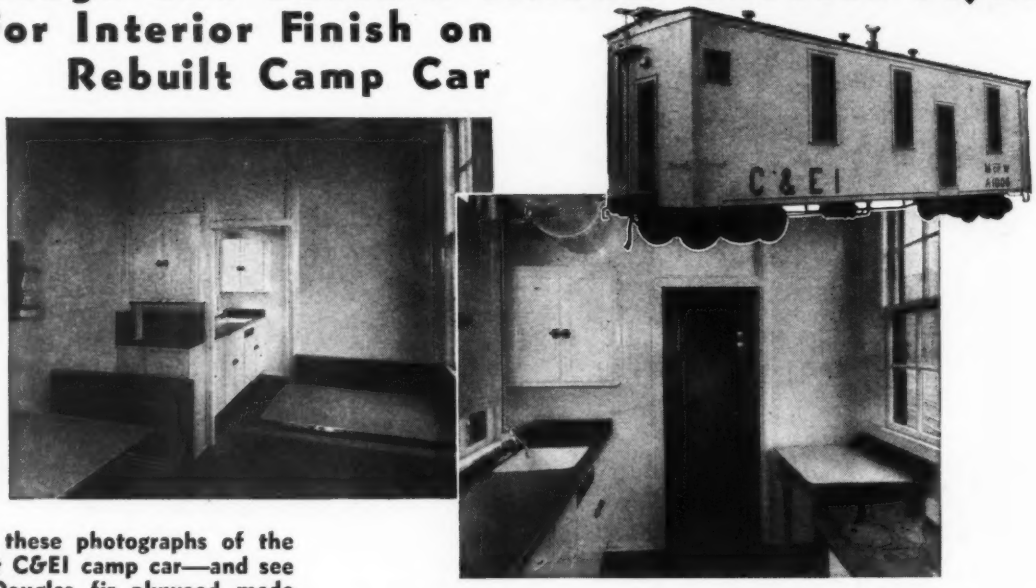
Armored

THE RAIL JOINT COMPANY INC.
50 CHURCH STREET NEW YORK, N. Y.

DOUGLAS FIR PLYWOOD
DOES ANOTHER
RAILROAD JOB BETTER!



Chicago and Eastern Illinois Chooses Plywood For Interior Finish on Rebuilt Camp Car



Study these photographs of the rebuilt C&EI camp car—and see how Douglas fir plywood made possible a smoother, more attractive interior. It's another example of the versatility of this strong, rigid, light-weight structural material.

An old 40 foot box car, the inside sheathing was removed and the car straightened up. Then the interior was finished with ½" plywood.

In new construction Exterior type Douglas fir plywood might also be used in a ⅜" thickness for outside sheathing.

Here are the advantages of Douglas fir plywood as an interior finish material for cars:

1—Costs are reduced. The large plywood panels—up to 4 x 8 feet in size—are applied faster, with a minimum of cutting and fitting.

2—Strength is assured. Douglas fir plywood's cross-laminated construction gives each panel an amazing strength, rigidity and durability. Walls are kick-proof, puncture-proof, split-proof.

3—The car is tighter—warmer. The reduction of joints and cracks means a car that is easier to heat in winter, cooler in summer. Drafts are minimized.

4—Appearance values are increased. The smooth, attractive plywood panels are easily and quickly given any type of finish.

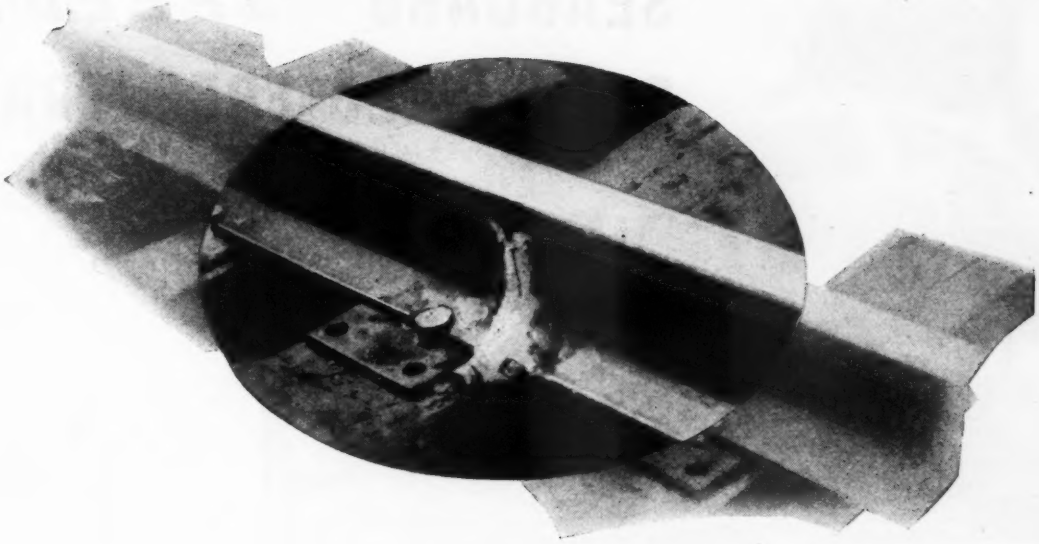
There is a type and grade of Douglas fir plywood for every railroad use: Interior type in several thicknesses and appearance grades; Exterior type also in several thicknessess and appearance for uses that are to be permanently exposed to the weather or moisture; Plyform, a special type in several thicknesses, for forming concrete structures.

For recommendations on the use of Douglas fir plywood in car construction or other railroad uses, write or phone: Technical Director, Tacoma, Washington; Field Engineer at 1707 Daily News Building, Chicago 6; 205 East 42nd St., New York 17; 1224 Shoreham Bldg., Washington, D. C. 5; 701 Cogswell Road, El Monte, California.

Douglas fir plywood is now available only on priorities. Application for allocation must be made by suppliers to the War Production Board.

DOUGLAS FIR PLYWOOD ASSOCIATION
Tacoma 2, Washington

SPECIFY DOUGLAS FIR PLYWOOD BY THESE "GRADE TRADE-MARKS"



THIS IS A THERMIT WELD

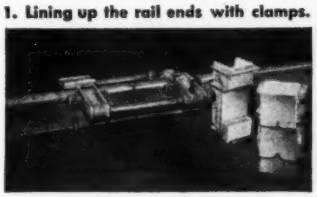
Here you see a section of track with its rail ends joined by Thermit welding—a process that has been used by many leading railroads for eliminating troublesome mechanical rail joints on main line track, in tunnels and at street crossings.

By Thermit welding rails into continuous lengths, joint maintenance is permanently eliminated... rail life is increased... rail replacements are minimized... there's less wear and tear on rolling stock and safer, smoother operation at higher speeds.

The equipment for Thermit welding is light... portable, and the welding can be done "on location" by your own crews after brief instruction by an M&T representative.

We have produced a fifteen-minute color and sound 16 mm. moving picture, "Thermit Welding at the Moffat Tunnel" which shows the process in detail. Prints are available without charge.

1. Lining up the rail ends with clamps.



2. Mold box filled with mold sand.

3. Grinding the finished Thermit weld.

METAL & THERMIT CORPORATION

120 BROADWAY, NEW YORK 5, N. Y.

ALBANY • CHICAGO • PITTSBURGH • SO. SAN FRANCISCO • TORONTO

Specialists in welding for nearly 40 years. • *Manufacturers of Murex Electrodes for arc welding and of Thermit for rail welding*

SEABOARD SPEEDS OVER WEED-FREE TRACK

SEABOARD RAILWAY
THROUGH THE HEART OF THE SOUTH

Diesel-powered Silver Meteor Streamliners are helping Seaboard Railway speed up the movement of its record-breaking traffic over hundreds of miles of tracks. The operation of these high-speed trains calls for clean, weed-free track, with minimum maintenance costs.

Performing a thorough job with a minimum of help is what makes Woolery Weed Burners invaluable on more than 75 Roads operating hundreds of these machines.

Giant Octopus Model with 5 burners for main track.

Woolery Labor-Saving Equipment

WEED BURNERS

5-burner, 3-burner, 2-burner and 1-burner models available

TIE CUTTERS **CREOSOTE SPRAYERS**

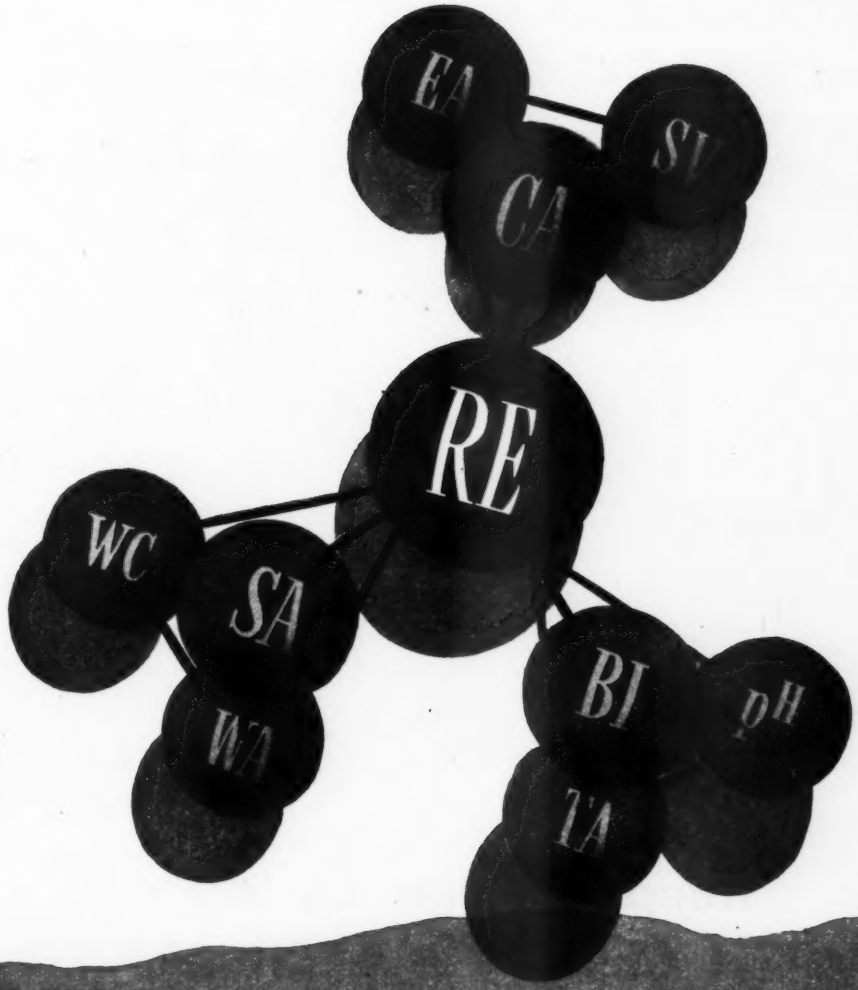
WOOLERY MACHINE COMPANY

MINNEAPOLIS — Pioneer Manufacturers of — MINNESOTA

RAILWAY MAINTENANCE EQUIPMENT

RAILWAY WEED BURNERS • MOTOR CARS • TIE CUTTERS • TIE SCORING MACHINES • RAIL JOINT OILERS • CREOSOTE SPRAYERS • BOLT TIGHTENERS

EXCLUSIVE EXPORT REPRESENTATIVES: PRESSED STEEL CAR COMPANY, INC., PITTSBURGH, PENNA.



THIS IS WHAT HAPPENS WHEN YOU WASH A LOCOMOTIVE

Correctly cleaning a locomotive is no simple operation... these elements must go into action...

Wetting Action *(WA)* must lower surface and interfacial tensions and allow the cleaning solution to penetrate to surface of the base. Emulsifying Action *(EA)* must disperse grease and oil as tiny globules, and by suspension prevent redeposition. Saponifying Value *(SV)* must convert organic fats and oils into soluble soaps, and Solvent Action *(SA)* put soils into solution. Colloidal Activity *(CA)* must disperse solid soils into minute particles which may then be easily removed. Water Conditioning *(WC)* removes or controls the elements which cause water hardness.

Correct Buffer Index *(BI)* assures ability to absorb either alkaline or acid soil, thus prolonging efficiency of the solution. Proper *pH* assures the correct measure of energy of alkalinity and Total Alkalinity *(TA)* must supply maximum active cleaning energy.

In formulating a cleaning compound, therefore, it is obvious that no one factor is a magic key to all problems. The answer is in determining the relative value of *all* these factors as they apply to *your* problem.

Putting these factors into correct balance is a responsibility you can entrust to Turco chemists —a responsibility for which their two decades of Research and Experience *(RE)* have well qualified them. Take your problem to Turco

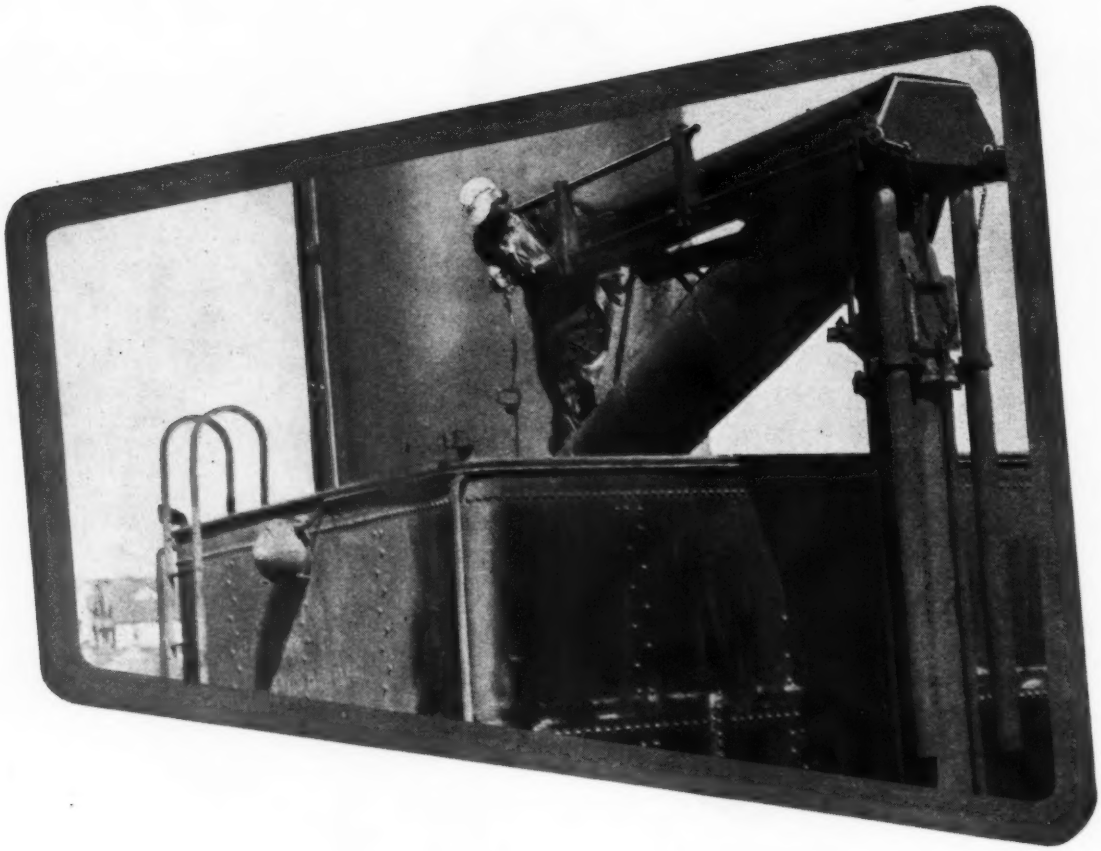
For a fuller explanation of these vital factors, write for Turco's Booklet on your firm letterhead, please.

TURCO

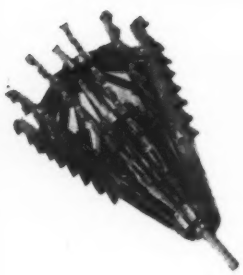
Turco

INDUSTRIAL CHEMICAL COMPOUNDS

TURCO PRODUCTS, INC. *Main Office and Factory:* 6135 S. Central Ave., Los Angeles 1, Calif. • *Southern Factory:* 1606 Henderson St., Houston 1, Texas • *Chicago Office and Factory:* 125 West 46th Street, Chicago 9 • *Offices and Warehouses in All Principal Cities*



Keep Servicing Up to Par
WITH CLEAN WATER MAINS



To keep trains running on their faster schedules of today's traffic, rapid water delivery at engine servicing time is essential. Only by having water mains clean and free of sludge and incrustations can full water flowage be secured and servicing time kept at a minimum.

With Tools Like These
Pittsburgh's Experts Can
Clean Your Pipes Faster,
Better and More Economically

PITTSBURGH PIPE CLEANER COMPANY

433 Melwood Street, Pittsburgh 13, Penna.

PHILADELPHIA - NEW YORK - BALTIMORE - WASHINGTON - CHICAGO - ST. LOUIS - DETROIT

Missouri-Pacific Double Track Job Shows How You Can

Cut Costs with TOURNAPULLS

Contractor Kraus strips overburden from rock cut with Tournapulls, then shifts prime movers to trailer use for rock hauling . . . This double duty cuts equipment investment.

Fast rubber-tired Tournatrailers haul rock from 100 ft. cut on Missouri-Pacific's relocation project near Barrett Station, Mo. Same prime mover with Carryall Scraper also handled stripping above the rock.

This rugged LeTourneau Dozer helped keep the fill in shape for the four end-dump Tournatrailers.

When Samuel Kraus Co. of St. Louis, Missouri, undertook the opening of a new double track for the Missouri-Pacific Railroad on the main line between St. Louis, Denver and Omaha, four Super C Tournapulls moved in to excavate earth down to a heavy rock cut of approximately 400,000 cubic yards. When the rock was reached, Kraus shifted his Tournapull prime movers from Carryall Scrapers to Tournatrailers for shovel loading, thus reducing his equipment investment.

3,000 FEET, 8 LOADS HOURLY

These fast, job-proved Tournatrailers, loaded by a 2½ yd. shovel, hauled 8 loads per hour on a 3,000-foot round trip . . . end-dumped their heaping loads of rock onto the fill, which was kept in shape by rugged LeTourneau Dozers.

Like many others who are successfully cutting railroad costs with LeTourneau off-track, rubber-tired rigs, Samuel Kraus Co. finds these one-man operated units adaptable to scores of uses. Interchangeable Carryalls, Trailers and Cranes extend Tournapull savings to such railroad construction, maintenance and operating jobs as these:

- New grade construction
- Curve relocation and grade reduction
- Widen banks and slopes
- Dig, widen and deepen drainage ditches
- Grade for new sidings, spur and passing tracks
- Remove slides, fill-in and repair washouts
- Coal handling and stockpiling
- Moving and shifting tracks
- Transporting and placing bridge members, drainage structures, etc.
- Clearing tracks of wreckage in emergencies
- Loading and unloading work train supplies and freight cars
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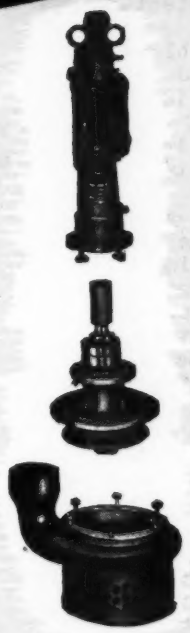

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Engineering and Maintenance
SIMMONS-BOARDMAN PUBLISHING CORPORATION
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CHICAGO, ILL.

Subject: Our Entire Staff —
Working in Your Behalf

December 1, 1944

Dear Reader:

I do not need to tell you, I am sure, of the value of the advertising pages in a publication such as Railway Engineering and Maintenance, but what may have escaped your attention is the fact that such advertising does not just happen. First, many manufacturers with products of interest to you must be encouraged to bring them to your attention regularly in our pages, and secondly, they must be urged constantly to make each presentation of greatest value to you.

It is true that the advertising pages are the life blood of most publications. Without them many publications could not exist, especially those serving a single industry, or, as in the case of our publication, one department of an industry, without excessive subscription rates. However, essential as advertising is to our publication, it has only one real justification, and that is to serve the manufacturer and you, our reader.

We editors of Maintenance, who are known to many of you personally through our traveling and other activities, have the responsibility of seeking out and preparing the information included in the editorial pages, and all of us have background and experience to that end. Our counterpart, with similar responsibility for the advertising pages, is our sales staff, just as your company has a sales staff, and I feel that you will be interested to know that, like the editors, those on this staff are as much interested in making the advertising pages of value to you as we are in making the editorial pages of greatest value.

In this connection, it is not without significance that the business manager of Railway Engineering and Maintenance is a former maintenance of way man. Wayne Hickey, who attended the University of Arkansas, worked in various capacities in the engineering and maintenance department of the Illinois Central before becoming connected with Maintenance in 1931, and associated with him are a number of other men with practical experience in railway engineering and maintenance work before joining our sales staff.

The point of interest to you in this regard is that, from cover to cover, each issue of Maintenance is prepared by men who know of your heavy responsibilities, who are interested in your problems and needs, and who are dedicated to assisting you in every way possible. In other words, as a team, we are all "working in your behalf".

Sincerely,

Neal D. Howard

NDH:KW

Editor

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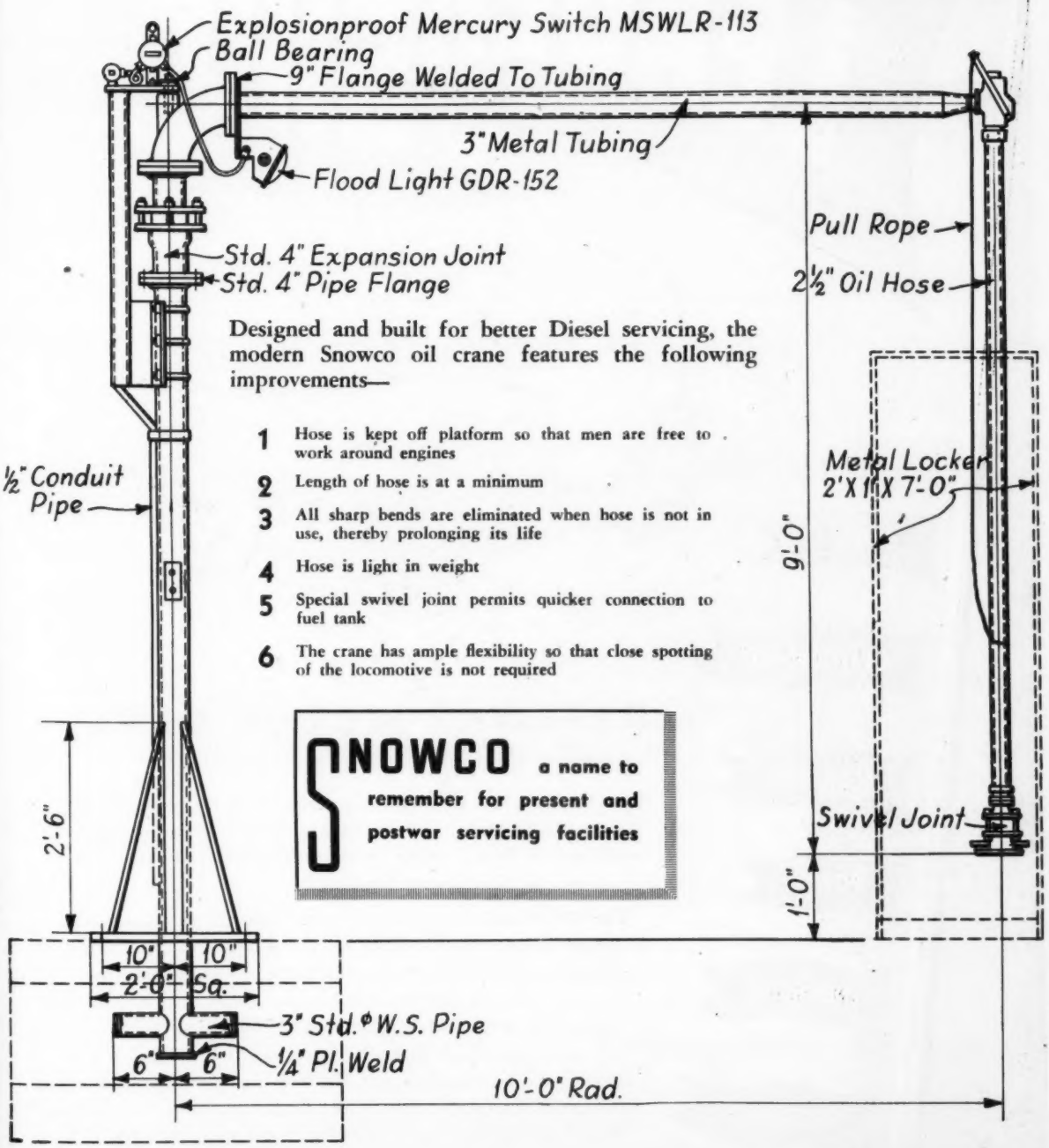
A MODERN OIL CRANE

by Snowco



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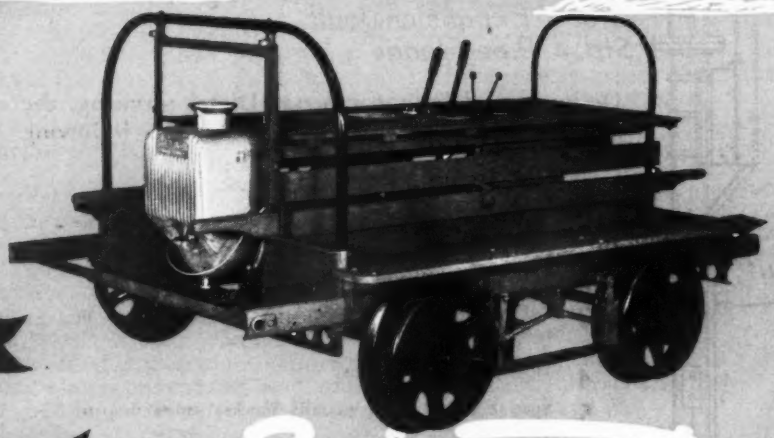

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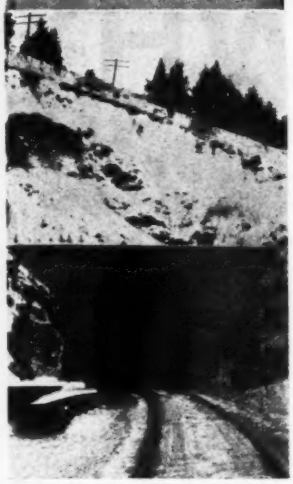
Performance ON THE JOB COUNTS

OF ALL THE CARS IN SERVICE TODAY...MORE THAN HALF ARE FAIRMONTS



Railway Engineering and Maintenance

NAME REGISTERED U. S. PATENT OFFICE

DECEMBER, 1944

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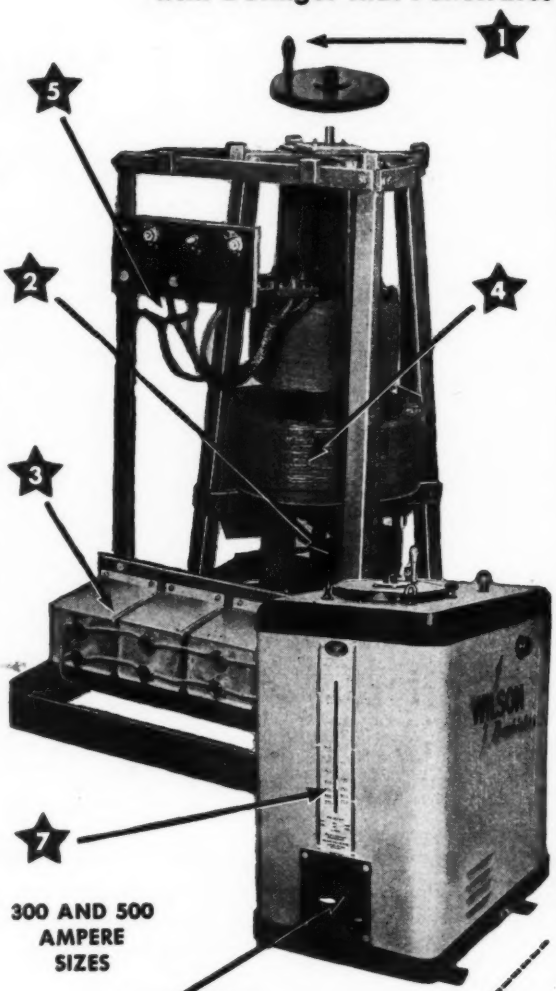

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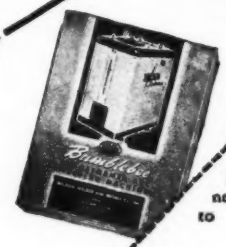

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Railway Engineering and Maintenance

Passenger Service—

Exceeds All Previous Records, and Must Continue

With railway passenger service playing an important part in the successful war effort of the country, both directly and indirectly, and certain to play an equally important role until the end of the war, those in the maintenance of way and structures departments of the railways should derive a large degree of satisfaction from the important contribution which they have made to these achievements to date, and, with foresight and determination, should resolve that, to the extent of their ability, the fixed properties will not limit the war transportation effort of railways in the days that lie ahead.

Besides witnessing the increasing number of passenger trains rolling by them on the right-of-way, maintenance men have many other daily reminders of the increased passenger service being rendered by the railways, including the increased toll that is being taken of the tracks; the increased effort being required to maintain comfortable and safe riding conditions; the increased attention being required in the scheduling of every track maintenance operation to avoid interference with trains; not to mention the increased difficulties encountered in carrying out many of their routine operations because of stepped-up passenger train schedules.

But how many maintenance men realize the full extent of the war-time passenger service being rendered by the railways—that in July of the present year, for example, passenger cars had an average daily movement of 290 miles, compared with an average movement of 177 miles a day in July, 1940; that the number of passengers carried one mile per car averaged 9,819 in July, 1944, compared with 2,623 in July, 1940; that each passenger locomotive on the average pulled trains 191 miles daily in July, 1944, compared with 148 miles daily in July, 1940; that the average number of passengers per train jumped from 66.9 in July, 1940, to 216.4 in July, 1944; and that whereas each passenger locomotive hauled an average of 9,906 passengers one mile daily in July, 1940, they hauled an average of 41,335 passengers one mile daily in July, 1944.

Summarizing these and similar performance figures, it is seen that the railways, with 6,768 fewer passenger locomotives and approximately 13,000 fewer passenger train cars, are today performing four and one-third times as much passenger service as they did in 1940. Four years ago this would have seemed an impossible task, but it has been accomplished by "packing them in," by keeping equipment in repair and rolling on more intensive schedules, and, of no small importance, by the maintenance of the track structure and other elements of the fixed properties—in spite of many war-time difficulties—to a standard that would permit this more intensive operation. And, as pointed out editorially in the November 18, Passenger Progress Issue of the Railway Age, this record-breaking performance in the handling of vastly increased military and civilian passenger traffic "will always rank as one of the greatest achievements of this war period".

But the war is not over—the war-time passenger-handling job of the railways is not completed. Having taken one pat on the back for outstanding accomplishments to date, let every railway officer and employee, including every officer and employee in the maintenance of way and structures departments, resolve, with new determination and effort, to see the job through. This job will grow increasingly difficult as wear, tear and deterioration in every part of the physical plant of the railways exceed replacements, but it can be done—it must be done, because failure in passenger transportation would not only be demoralizing on the home front, but would have reverberations on every one of our fighting fronts.

Power Machines—

Are Greatly Improving Maintenance

WITHIN the memory of more than a few railway officers, the ditching of cuts was an item of maintenance that was to be avoided as long as possible, despite recognition that this work was essential to good maintenance. The reasons for this were the large number of men that had to be employed; a work train was needed to serve them; it was necessary to assemble from 20 to 40 flat cars, stake them and, in many cases, to equip them with portable side boards that were chained to the cars, but which could be lifted over the stakes; and a lidgerwood and plow were required for unloading the cars. In addition, heavy piles had to be driven on each side of the track near the unloading point to string the plow cable the length of the train, and the plow had to be switched back after each unloading.

Ditching provides a clear-cut example of the many improvements that have been made in maintenance practices and maintenance tools during the last few decades. The large ditching gangs equipped with picks and shovels, first gave way to the ditcher which was operated on a train of flat cars, but the lidgerwood still prevailed for unloading, although eventually it gave way to the side-dump car. Now, through a process of evolution, both of these units have been superseded by the dragline and the tractor equipped with either a front-end loader or a bulldozer. In other words, the 200- to 300-men gang, the work train and the lidgerwood and plow, have been supplanted by a single unit requiring from 2 to 7 men, depending on the character and the volume of work to be done.

If the progress that has been mentioned had not taken place, the railways would be in an exceedingly unfortunate position today with respect to ditching, for the extreme labor shortage with which they are contending would make ditching on anything but a minor scale impossible, and ditching cannot be deferred without serious detriment to both present and future maintenance. If it is deferred unduly, the later cost in money and man-power will be greatly in excess of these costs if the work is done currently.

Today, however, a ditching program is not so much a matter of man-power as of equipment. It does not interfere with traffic and it does not require the elaborate preparation and constant supervision that it once did. Furthermore, any one who remembers the days of hand ditching will testify that the mechanized job of today not only moves more material at greatly reduced cost, but that the appearance of the cuts when the work has been completed is superior to that left by the ditching gang, even when the practice is to leave a trimming gang finish the job.

In general, the present generation of maintenance officers, although more favorably disposed toward the mechanization of its forces than any generation that has preceded it, does not have the same appreciation of the benefits it is deriving from power machines and power tools as those whose memories hark back to the time when most maintenance tasks were performed manually. Yet, they are fully aware of their dependence on power equipment and of the assistance it has been in the present emergency. The lessons these officers are learning through experience during these difficult days are likely to stay with them long after the emergency has passed, and to be powerful factors in shaping their policies with respect to the use of work equipment in the future.

Winter Preparations—

Have All the Possibilities Been Explored?

IF THE WINTER that is now practically upon us should be only moderately severe, the problems facing maintenance men will be difficult enough. If it should prove to be exceptionally severe, with extremely low temperatures accompanied by heavy snow storms, the problem of keeping the tracks and other facilities open will be such as to challenge all the skill and ingenuity at the command of those who have this responsibility. In facing this problem such officers cannot permit themselves to lose sight for a moment of the fact that the war is still in a critical phase in that any prolonged disruption of the smooth flow of war materials to the fighting fronts, such as might ensue if the railroads were to be caught off guard in the matter of winter planning, could have the effect of delaying operations on the war fronts and thereby the coming of peace.

Ever since the man-power situation became critical following the outbreak of war, maintenance men have dreaded the coming of winter because for many years their plans for fighting snow have been predicated largely on the availability of an ample supply of casual labor. This source has long since almost entirely disappeared, but during the three years since Pearl Harbor the fates have been kind to the extent that the winters have generally not been more than moderately severe, so that, by and large, the railways have been able to avoid serious difficulties during snow storms without the necessity of augmenting their regular maintenance forces to any considerable extent.

Thus, the circumstances that have enabled the roads to escape serious trouble during the last three winters have been purely fortuitous. That there is no assurance this good fortune will hold through the present winter is obvious. In fact, in view of the succession of relatively mild winters that has prevailed for several years, the probabilities for the present winter are in the other direction.

For this reason, more than ever before, maintenance men must be prepared for the worst. It can be assumed that routine preparations for winter on most roads have already been completed. But, in view of the serious labor shortage that prevails, will these be sufficient if the weather proves to be exceptionally rigorous? If the answer is "no," then definite plans should be made immediately to cope with the most severe conditions that are likely to prevail.

In making such plans, every conceivable source of help must be explored. For instance, assuming that maximum use is being made of switch heaters and other types of snow-fighting equipment, has advantage been taken of all the possibilities for adapting other types of machines, such as weed burners, bulldozers and possibly even carryalls, to the task of snow disposal? With reference to the man-power problem, is it possible to make advance arrangements with various industries on the lines to furnish help in a dire emergency? This was done during World War I, and there is no apparent reason why it should not be done again if circumstances warrant. Also, the suggestion has been made that persons already employed elsewhere might be induced on patriotic grounds to tender their services to the railroads on a temporary basis during severe storms, such appeals being addressed to them through local papers or over the radio. Under present conditions it would seem that the end justifies the means, and no possibility should be discarded until it has been thoroughly explored to determine if it can be put to use during the emergency.

When the first blizzard begins to blow it will be too late to make preparations for coping with it. This *can* be the last winter of the war. Let it not be said in the future that fighting was prolonged as a result of transportation delays that occurred on the home front because of the inability of the track maintenance forces to cope with severe weather conditions.

Rail Web Cracks—

Caused by Maul Blows at Low Temperatures

RECENT tests conducted by the research staff of the Association of American Railroads for the Rail committee of the American Railway Engineering Association show conclusively that the web of a rail, when at low temperatures, can be fractured readily by a spike maul blow. In the tests referred to, which are described in this issue, numerous rail specimens of sections ranging from 90 lb. to 152 lb. per yd., cooled to temperatures ranging from —13 deg. to +25 deg., developed web fractures as a result of blows on the mid-section of the web. This disclosure is of concern to every supervisory roadway officer, and through them, should be made a matter of equal importance to every employee working on the track.

Experienced trackmen have long known that it is improper to strike a rail at any point with a spike maul or any other heavy object. Maintenance of way rules or special instructions are specific in forbidding this. Furthermore, these same men have long known that rail steel becomes increasingly brittle when subjected to low temperatures.

In spite of this, it is probably true that many of these same men, who know full well the damage that can be done to a rail base with a spike maul, have not realized the potential damage that can be caused to the web by a spike maul blow. Many will admit that they did not believe that damage to the extent of fracture was possible. Yet, the fact that it is possible, especially when the rail is at low winter temperatures, has now been demonstrated by the tests referred to.

This matter is of such importance that it is not enough for supervisory officers to assume that their men know the damage, if not the danger, involved in the careless use of the spike maul. It is not enough that they assume that their men have little occasion to strike the web of a rail, because workmen have been known to strike the webs of rails during gaging and shimming operations to move the rail inward or outward; to strike the webs of rails in track to jar them loose when adjusting expansion; and to strike the webs of rails during rail-laying operations to free them of dirt, cinders, ice and snow as they are picked up and about to be lowered into position in the track.

In the light of the tests cited, such practices should be prohibited, regardless of the temperature, and nothing short of positive measures should be taken to insure that every man on the track understands this. This is especially important under present conditions when so many roads are being called upon to lay rail during the winter months, and when so many inexperienced men are being employed on the track.

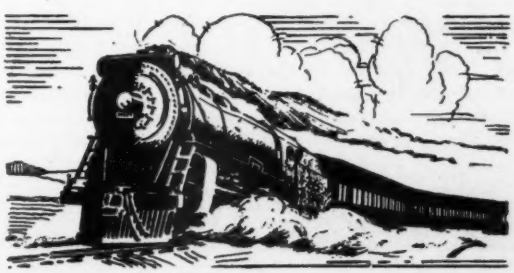
Annual Index—

Yours is Ready, But You Must Ask For It

FOR THE first time in the history of *Railway Engineering and Maintenance*, dating back to 1916, a complete Annual Index to all issues in the previous year will not form a part of its January issue. The war effort must be served, and one of the ways in which we can do this is to save paper—every pound of paper—that is not essential to serve you adequately.

But your copy of the Annual Index will be available to you if you ask for it—in fact, is now being prepared, awaiting your request. In other words, sufficient copies will be run off to meet the needs of all of you who bind or file your back numbers, or who for any other reason desire a complete, composite index of the twelve 1944 issues. If you want a copy of the Index, make your request directly to our circulation manager—H. E. McCandless—30 Church Street, New York 7, N. Y.

We realize that this will be an added inconvenience to you—to many of you—because we know that a large number of our readers bind or otherwise preserve their back issues for future reference. However, we know too, that when you realize, as we do, that every unnecessary page of paper saved in issuing unnecessary copies of our Annual Index will help the war effort, and will allow us more paper to include in our feature pages, you will not be too disturbed by this inconvenience.



The Boys Performed Practically All Operations Except the Unloading of Ballast

The Work Appealed to the Boys as a Means of Conditioning Them for School Athletics

Pere Marquette

THIS past fall the entire Chicago-Petoskey division of the Pere Marquette was rooting for and following closely the football success* of South High at Grand Rapids, Mich. The reason for this unusual behavior was that the team of this high school was made up largely of Pere Marquette "gandy dancers"—boys that spent the entire summer working on the tracks and living in one of the camps established by that road. This venture in the employment of high school boys proved exceptionally successful, the reason being that everything possible was done to care for and train the boys properly. During the summer the railroad came to have a high regard for the boys and the latter developed a new knowledge of and regard for "railroading."

More Boys Needed

In 1943, the Pere Marquette employed a limited number of high school boys during the summer in track maintenance work. Faced with the necessity of completing a larger maintenance program in 1944 with less labor available, a concerted effort was made to recruit a large number of high school boys, as a result of which approximately 500 boys were hired for work in section and extra gangs during the last summer. Of this number, about 220 were employed on the Chicago-Petoskey division, of which more than 100 were recruited at Grand Rapids to form two extra gangs of 50 boys each. The remainder were secured from other towns on the line and were added to local section or extra gang forces.

The boys that were hired at Grand Rapids were the only ones on the system housed in camps, and nothing was overlooked in their training, supervision and care. Aside from the work accomplished, the entire project was handled in such a manner that it was a highly beneficial undertaking from a public relations standpoint. The boys, their parents and their friends have a new high regard for the Pere Marquette, and have also learned more about railroading and railroad problems. In fact, the result has been to promote good will of a kind that will last for many years.

Athletic Appeal

The idea for the boys' camps first developed at a conference last spring on how to secure more high school boys during the coming summer for track work on the Chicago-Petoskey division. At this conference it was suggested that track work could be "sold" to those boys

* As this issue goes to press we learn that the South High School football team at Grand Rapids has won all games played thus far during the current season, with only one more game scheduled, and has already won the high school football championship of the city for this year.

In the summer of 1944, the Pere Marquette, expanding a practice begun the previous year of employing boys for track work, established two extra gangs composed entirely of high school boys. These gangs lived apart from other maintenance forces in camps consisting of new bunk cars or hutments. Modern methods were used to train the boys for their work. This enterprise was not only a big success for both the boys and the railway, but also proved beneficial from a public relations standpoint

Women Cooks Were Employed at Both Camps to Provide the Boys a More Homelike Atmosphere

"Makes a Touchdown" With High School Boys

interested in athletics as an ideal way to develop them physically and condition them for football or other sports in the fall. This idea "started the ball rolling," and other conferences followed to perfect details of the plan.

To employ minors in Michigan, approval must be secured from the Commissioner of Labor and Industry. Other stipulations are that a monthly report must be made of all accidents and that the work week for minors be limited to 48 hours. To secure the approval of the state and to be sure that the camps would be operated properly, it was decided that some man other than the track foreman should be in charge, who would be called a counselor. A plan was finally developed for establishing two separate camps of 50 boys each, to be occupied exclusively by the boys and a number of school coaches and instructors who were to be engaged to live with them and to serve as counselors and timekeepers. There was to be no other supervision except for the extra-gang foremen, who were to return to their homes at night.

To recruit the boys in the Grand Rapids area, which has a population of more than 170,000, in competition with other industry, it was recognized that novel and effective methods would have to be used. As part of the recruiting plan adopted, two representatives of the railroad were designated to visit the various high schools for the purpose of interviewing prospects for counselors and timekeepers and to promote the idea with the boys. These representatives were H. B. Lyon and Clarence E. Meyer. Mr. Lyon, formerly chief clerk to the division engineer at Grand Rapids, had been in charge of labor procurement on the division

Menus Were Designed to Produce a Balanced Diet and a High Calorie Allotment

for more than a year, with the title of assistant supervisor of track. Mr. Meyer was head of the English department at Grand Rapids Junior college and had served on the railroad as a gravel inspector during the previous three summers.

These men selected the counselors and timekeepers for their knowledge of athletics and their sympathetic understanding of boys and boys' problems. Recruiting was then begun among those boys who were interested in athletics and who were strong enough to perform and benefit from track work. When the boys learned of the opportunity to work on the railroad and to live in their own camps in the company of coaches and teachers whom they liked and respected, the rush for applications started and the railroad soon had enough boys signed up to fill both camps and to provide a good-size waiting list besides. This list enabled the gangs to be kept fully manned, or nearly so, at all times.

Sleeping Quarters of the Camp at Breedsville Consisted of These Prefabricated Hutments

New Housing

In the meantime, arrangements proceeded for housing the boys. It was planned to establish one camp, to be composed of outfit cars, at a point near Holland, Mich., and the other camp, consisting of hutments for sleeping quarters and outfit cars for the kitchen, diners, etc., near Breedsville, Mich. To assure the best possible quarters for the boys, it was decided to rebuild and use a group of 18 box cars. These were stripped down to the trucks and rebuilt with new material into bunk, kitchen, dining and foremen's cars. The outfit established at Holland consisted of five bunk cars, two diners, one kitchen car, one commissary car, one car for the counselor and the timekeeper, one tool car, one water tank, and one shower car. That at Breedsville had five hutments instead of five bunk cars, the remainder of the cars being the same as those at Holland.

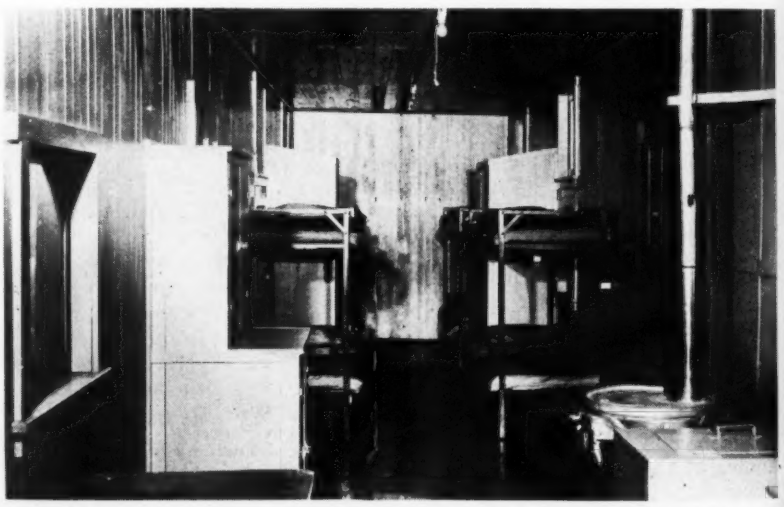
The five hutments for the Breedsville camp were secured from the Aladdin Manufacturing Company, Bay City, Mich. These are portable, prefabricated structures with insulated side walls and ceilings. They were painted an olive-drab inside and out, and are exactly the same as those furnished by that company to the armed forces. The bunk, dining, kitchen and counselor's cars were painted a light olive-green inside and a standard box-car red outside. All the living and eating quarters were fully screened. Ventilating fans were installed in the kitchen cars.

All equipment and furnishings in both camps were purchased new, including beds, mattresses, pillows, blankets, tableware, silverware, etc. The boys furnished their own sheets, pillowcases and towels. Each camp had electric lights in all the cars and buildings, and hot and cold running water in the shower and kitchen cars. Water was furnished from a well driven at each camp, which was equipped with an automatic-electric pressure pump. Hot water was provided at each camp from a heater embodying a coal stove. The water at each camp was tested and approved in advance by the State Health Department.

Women Cooks Provide Meals

It was decided that women cooks would give the boys more of a home atmosphere and that they would have a better understanding of their needs. Fortunately, the road was able to secure four good women cooks, a mother and her daughter for each camp. Quarters for the cooks were provided at one end of the commissary car. These were furnished with linoleum floors, rugs, mirrors and wood beds with innerspring mattresses. The boys thought highly of the cooks and at the end of the season bought presents for them.

Every effort was made to give the boys the best food that could be provided. Menus prepared by Mr. Lyon and the cooks were designed to provide a balanced diet and a calorie allotment in excess of normal for boys of high school age. Weight charts for the boys were kept by the counselors. These showed that during the first three or four days practically all of them lost weight, after which they began



The Outfit Cars at Both Camps Were Provided by Reconstructing a Group of 18 Box Cars

to gain. By the end of the summer all of the boys weighed 5 to 20 lb. more than at the beginning of the season. One boy weighed 227 lb. at the start of the season, 212 lb. at the end of the first week, 240 lb. at the end of the third week, and 237 lb. at the end of the season. Each gang of 50 boys drank 30 to 35 gal. of milk a day.

Preliminary Training

A week before the boys were to go to work a meeting was called for the boys in each camp, to which the parents were also invited. At these meetings the boys were told why they were needed on the railroad, what would be expected of them, and how they would be expected to conduct themselves. Details of how they would be housed, fed, etc., were also explained and they were told what kind of clothing they would need. The desirability of wearing safety shoes was stressed, and 90 per cent of the boys purchased them. Since most of the boys had never worked on a railroad before, one of the objectives of the talk was to make them "railroad conscious." To this end, the motion picture "Men of Maintenance" was shown, and a portion of the Pere Marquette's visual training program for maintenance employees was also presented. The program included slides of rail defects and of motor car operation, accompanied by an explanatory talk. At the close of each meeting the parents and boys were invited to ask questions.

The week-end before the boys were to leave for work, one set of outfit cars and one of the hutments were placed on display near the passenger station. Through the local newspapers the parents and anyone else interested were invited to inspect the cars, and approximately 2,000 people accepted the invitation. The favorable impression thus created, together with the preliminary talks, which were attended by many of the parents, created a new feeling of good will for the Pere Marquette in particular, and for railroads in general, among the townspeople.

Further Training

The boys' camps were established on Monday, June 16. The first morning was spent allowing the boys to become oriented. In the afternoon of the first day they were given a "chalk" talk, in which was explained the necessity for the work they were to do, what the heavy traffic was doing to the track, why ballast and ties had to be renewed and how re-

The Foremen and Assistant Foremen in Charge of the Boys' Gangs Were Selected With Care to Secure Men of Exceptional Capabilities

ballasting was accomplished, beginning with bank restoration. In addition, the methods to be used in skeletonizing and surfacing the track were explained in detail with the aid of sketches depicting the various operations.

All through the talk emphasis was placed on the importance of working safely. In fact, this factor was emphasized in every discussion with the boys all during the summer. In this connection the foreman, the counselor and the timekeeper with each gang were also instructed to watch the boys carefully, to urge them to exercise constant diligence and caution to the end that accidents would be reduced to a minimum. In addition, the counselor's car was equipped with a first aid kit, and both the counselor and the timekeeper were well versed in first aid. As an example of the safety precautions taken, all the claw bars used by the gangs were painted a bright yellow at the point where they should not be held to avoid pinching fingers. As a result of these precautions, there was not a single serious or lost-time accident in either camp. One boy bruised a thumb nail and two of them had mild cases of poison ivy.

The chalk talk completed the preliminary training of the boys and the next morning they began work. On the first day that the camps were in operation the water supply at each location was again checked and approved by a representative of the State Health department. On the second day, a representative of the Commissioner of Labor and Industry inspected the camps thoroughly and pronounced them very satisfactory. After the boys had worked two or three days, they were given another talk on the methods of doing their work and on how to conduct themselves during their leisure hours. About the middle of the season they were given a third and final talk to remind them of some of the principles involved in working safely.

Work Programs

The camps at both places were located two miles from town at about the center of the work assigned. The gang at the Holland camp worked on a ballasting job where gravel ballast was being replaced out-of-face with stone, including the usual renewal of crossties and other work. The boys at this camp were also employed on adjoining sections in making tie renewals and in surfacing track.

The Breedsville gang was located in gravel-ballast territory. The work performed by this gang consisted mostly of cleaning out the foul ballast on the inside of several curves, including rather heavy crosstie renewals. It was also used at other locations for out-of-face surfacing with a light running lift of 1½ to 2 in.

The foremen and assistant foremen who were selected to supervise the gangs were exceptionally capable trackmen of excellent character. When instructing these foremen in the proper methods of handling the boys emphasis was placed on the fact they could not be handled like

(Continued on page 1134)

Maintaining Water Service Facilities—

Miscellaneous Pumps

By C. R. KNOWLES
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IN ADDITION to the conventional types of pumps in general water service use, other types and kinds of pumps are used extensively for various purposes. These pumps may be classed as special service pumps, and for convenience in the following discussion they have been grouped under the heading "miscellaneous pumps." Included in this group are: rotary pumps, hydraulic rams, pulsometers or steam vacuum pumps, jet pumps and injectors, and portable pumps of various kinds. While these pumps are not confined to water service use, they are maintained by the water department forces and come under the general jurisdiction of that department.

Rotary Pumps

Rotary pumps are positive displacement pumps with revolving pistons or rotors, as distinguished from reciprocating direct-acting pumps. As the name implies, they operate on the rotating principle, having one or more chambers in which the piston or rotor revolves within the pump casing. The principal difference between the various types and makes of rotary pumps is in the form of the pistons. They may be in the form of vanes, cams, gears or screws. These pistons, revolving within the casing, draw in and discharge the water or other liquid without changing the direction of flow. They operate without suction or discharge valves, although it is advisable to place check valves on both the suction and discharge lines to facilitate priming and to protect the pump from surges in the discharge line.

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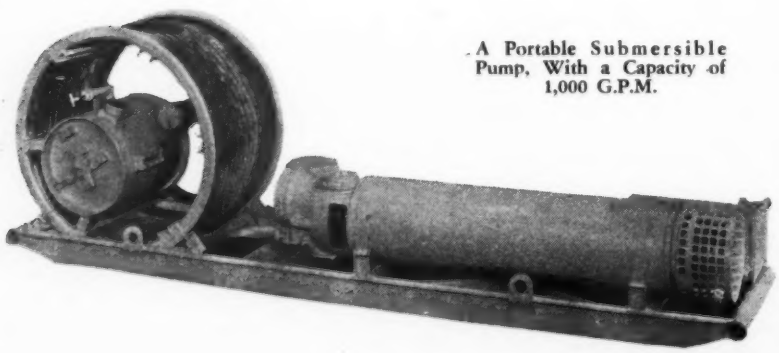
Rotary pumps are rarely used for pumping water in railway service, but they are used extensively in the smaller sizes for handling chemical solutions at water treating plants, and for handling oil and other liquids at storehouses and other points. One type, with double shafts and lobed rotors, is used quite extensively as a proportioning device at water treating plants. This type, termed a cyclodial water motor, operates by reversing the flow of water through the machine under a head, thereby converting it to a water motor. It is coupled to a chemical pump and as both the pump and the motor are positive displacement machines, the chemical feed is proportionate to the flow of water through the motor.

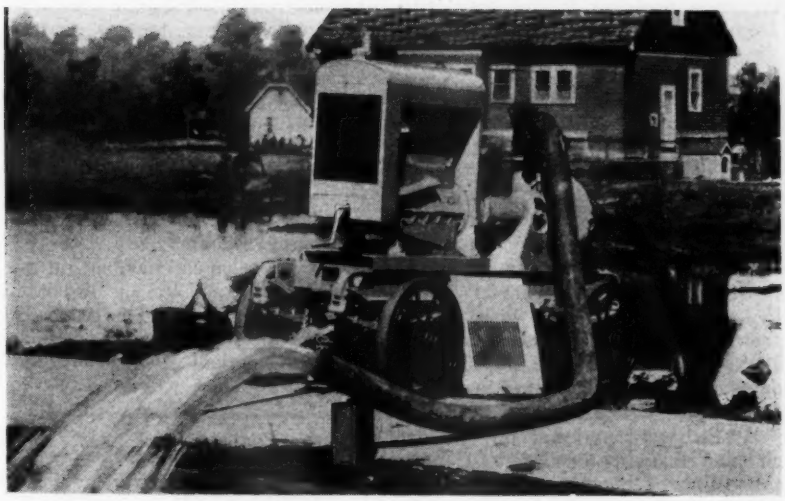
A comparatively recent development in rotary pumps, in this country at least, is one in which the piston or rotor is in the form of a helical screw connected to the driving shaft and revolving in a fixed stator, usually constructed of rubber. It is used for pumping chemicals at railway water treating plants, and the claim is made that it will handle semi-solids and some kinds of dry materials.

As with other types of pumps, the suction and discharge pipes should be of ample size to avoid excessive friction losses. Excessive suction lift will cause the pumps to become noisy in operation and will decrease their delivery. Suction lines must be air tight, for, while an air leak in the suction may not cause a complete failure of the pump, a bubble of air resulting from an air leak in the suction may expand to the extent that the delivery will be reduced materially; it will also cause erratic pump action because of the presence of the entrained air, and will lead to excessive wear and in extreme cases more serious damage to the pump. Both suction and discharge lines should be laid to grade to avoid air pockets forming at high points, for such pockets will seriously interfere with the operation of the pump.

As with other power driven pumps, rotary pumps should be in perfect alinement with the power unit driving them, for misalinement causes heated bearings, excessive wear on both bearings and pump and possible damage through breakage resulting from strains. It is sometimes necessary to provide a reduction gear between the power unit and the pump in order to secure the desired speed, as, for example, where it is driven by an electric motor. Here, two flexible couplings are required unless a gear motor or motor reducer is used, thus doubling the possibility of misalinement.



A Portable Submersible Pump, With a Capacity of 1,000 G.P.M.



This Portable Centrifugal Pump Has a Capicity of 500 G.P.M.

The piping is often responsible for throwing the pump out of line with the power unit, and this should be checked very carefully by the water service repairman if any indication of misalinement is present. This can be done by disconnecting the piping and checking the alinement of the pump and power unit. If it is found correct the piping should be adjusted accordingly. No pipe should be connected until it is found that the pump turns freely. Pipe should be supported in such a manner that there is no strain on the pump housing.

Rotary pumps are very susceptible to wear of pistons and casings, particularly when the water contains sand or grit. While some rotary pumps are designed to take up some of this wear automatically, they should not be used to handle water containing gritty material, as they will deteriorate rapidly under such conditions.

The clearance between the casing and the piston is necessarily close; therefore in reassembling a pump after repair or examination, the water service repairman should be careful to avoid setting up unequal strains in the casing or decreasing the clearance and thereby causing the piston to bind. On the other hand, minimum clearance between the casing and moving parts is necessary to avoid slippage and resultant loss in efficiency and delivery. This is of special importance where gaskets are used on the casing heads, for if the gaskets are too thin they will cause the pistons to bind and if too thick they permit slippage and loss of efficiency.

The pumper should give adequate attention to the adjustment of bearings and packing stuffing boxes; otherwise loss of power, excessive wear and scored shafts and bearings will result. All bearings should be provided with grease or oil cups to insure constant and adequate lubrication. If self-oiling bearings are used, they should be cleaned occasionally and refilled with good motor oil. Stuffing boxes should be well packed with the correct grade of packing and adjusted as required.

If the pump fails to deliver the required amount of water, it may be due to one or more of the following causes. The wrong direction of rotation,—this can be checked with the directional arrow on the pump casing. The speed of the pump may be too slow,—it should be kept up to the full speed for the required delivery, but should not be operated more than 10 per cent in excess of the rated speed. The pump may be worn, permitting too much clearance between the rotating parts and casing,—this may be corrected by reducing the thickness of the head gaskets, or it may be necessary to renew the rotating parts.

When handling volatile liquids, such as gasoline or hot water, vapor or steam may form in the suction line. When this occurs, the liquid should be delivered to the pump under a head. When heavy or viscous liquids are pumped, such as heavy cylinder oil, grease, varnish, asphalt or coal tar products, the material should be heated or delivered to the pump under a head and the pump operated at a reduced speed.

Rotary pumps are positive displacement pumps and any interruption to the discharge will result in damage to the pump or piping. Therefore, all discharge valves must be open before starting the pump to avoid damage to the pump or piping. Relief valves are built into some rotary pumps, but where not otherwise provided, a relief valve should be placed in the discharge line as a precaution against the accidental closure of valves. The discharge from the relief valve should be piped back into the suction line or the source of supply.

Hydraulic Rams

The hydraulic ram is a device through which a relatively large volume of water under gravity flow raises a smaller volume of the water to an elevation higher than the source of supply. It consists essentially of a water and an air chamber, together with the necessary valves. It is entirely automatic in operation and utilizes the effect of water hammer induced by the sudden stoppage of the flow of water to the ram. As the water enters the ram from the supply line (commonly called the drive pipe), the flow is stopped by an automatic valve which permits the water to escape freely until sufficient momentum is attained to close it. This sudden stoppage of the water opens another valve, permitting a portion of the water to enter the air chamber. The air is compressed until the pressure is balanced or equals that of the drive pipe, when the waste valve is opened and the process repeated. As the hydraulic ram is dependent upon the inertia of a moving body of water, the length of the drive pipe will have a bearing upon the efficiency of the ram.

The sudden stoppage of the water

No. 8 of a Series

This article deals with a group of pumps including rotary pumps, hydraulic rams, pulsometer or steam vacuum pumps, jet pumps and injectors, and portable pumps of various kinds under a general classification of "special service pumps." These units, while not confined strictly to water service use, meet many out-of-the-ordinary railroad specifications. Other articles of this series will discuss power units and the transmission and control for the various types of pumps most generally used in railway service.

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creates a pressure greater than that from the source of supply because of the shock or water-hammer effect. As a general rule, about one-seventh of the water supplied by the drive pipe can be raised to a height of five times that of the fall, the amount of water delivered decreasing in direct ratio to the increased height of delivery. For example, one-fourteenth part of the supply can be elevated ten times the height of the fall.

Desirable supply heads under which hydraulic rams should work range from 2 to 10 ft. Heads higher than 10 ft. result in excessive shock pressures and make it difficult to maintain the valves.

A small valve is located in the air chamber to supply the air lost through absorption by the water. This valve is termed a "snifter" valve and operates automatically. Rams may be so arranged that they can be operated by one supply while raising water from another supply, as, for example, where the power supply is unsatisfactory in quality for general use.

There is little to get out of order in a hydraulic ram if the correct frequency of strokes is maintained. The water service repairman should keep the supply discharge valve adjusted so that the ram makes short, quick strokes, which cause less wear and tear on the valves and other mechanism than slower, heavier strokes. With correct adjustment, the valves should last from 18 months to 2 years. Aside from the valves, the rams require no maintenance other than protection against damage from frost or other abuse. The piping should, of course, be maintained in good condition and should be as direct as possible. The area of the delivery pipe is usually about one-fourth that of the drive pipe.

It is estimated that there are only about 35 hydraulic rams in use in railway water service on American railroads, but it would appear that there is a field for their more extensive application.

Vacuum Pumps

A vacuum pump is identical with the direct-acting steam pump except for the ratio of the size of the steam cylinder to the water cylinder and the construction of the valves and springs. The steam cylinders of a vacuum pump are generally smaller than the water cylinders and the valves and springs are lighter.

Vacuum pumps are used chiefly in railway service in connection with steam heating systems for maintaining a vacuum on the system to increase and provide a quicker circulation, and for the removal of the water of condensation. Vacuum pumps require the same maintenance as other positive displacement pumps. It is of extreme importance that the heating system be kept bottle tight to insure their efficient operation.

Pulsometers

The pulsometer, sometimes classed as a steam-vacuum pump, consists of two pear-shaped chambers in one casting, with an air or discharge chamber above them. The two valve seats are located in the lower chambers, with one ball-valve which oscillates between the two seats. There are also suction and air-chamber or discharge valves. When filled with water, steam is admitted, forcing the water in one chamber through the discharge valve into the air chamber and discharge pipe. The steam comes in contact with the water when it reaches the passage leading to the discharge and is immediately condensed, thus creating a vacuum in the chamber just emptied. This pulls the valve over to the opposite seat, preventing the further admission of steam until the empty chamber has been filled. Pulsometers contain no moving parts other than the valves and require little maintenance other than maintaining tight joints and valve seats. They have been used to a limited extent in dewatering excavations, and while they require little attention, and will handle very dirty water without trouble, their efficiency is low and they are expensive to operate.

In the strict sense of the word, a so-called jet pump is not a pump at all. Devices coming within this category utilize the velocity of steam, air or water to raise water and are correctly designated as steam-siphons and air and water ejectors, respectively. In all well designed devices of this kind, the stream of steam, air or water is delivered in a jet from a nozzle, the jet passes through a restricted throat or opening identical with a venturi tube, drawing with it the water to be raised and imparting to it the energy derived from the velocity of the jet.

A crude form of steam siphon may be constructed by inserting a small elbow and nipple in a tee, with a short nipple to form the jet nozzle. For example, a short piece of pipe may be screwed in one end of a two-inch tee to form the suction pipe, and a longer piece in the other end to form the discharge pipe. A long threaded ⅜-in. nipple is screwed through a ⅜-in. by 2-in. bushing, an elbow with a short nipple is placed on the end of the long threaded nipple and the bushing is screwed in the side opening of the tee with the nipple pointing upward. A siphon of this kind will have a limited suction lift and discharge head and will be low in efficiency, but will answer the purpose in an emergency.

Steam siphons and air ejectors are commonly used for dewatering sumps, pits and excavations where steam or air is readily available. Water ejectors are largely used as cellar drains where other power is not available. There are no parts in siphons and ejectors to get out of order, and the only maintenance required is to keep the jet clear of obstructions and to maintain the pipe connections in good condition.

Injectors

The injector is primarily a device for feeding water to boilers under pressure. It utilizes the steam pressure of the boiler to lift the water from the source of supply and to force it into the boiler against the same pressure. This apparent anomaly is accomplished by discharging a jet of steam from a small nozzle or steam tube through a larger tube, termed the combining tube, thus creating a partial vacuum between the tubes, which brings the water into the injector and the steam then forces it through the combining tube at a high velocity. This velocity is converted to pressure which, because of the velocity effect, is higher than that of the boiler.

Injectors may be either of the lifting or non-lifting type, and may be either hand-controlled or automatic in operation. Injectors of special design will deliver water at four or five times the pressure of the steam used to operate them.

Injectors give little trouble if prop-

The Water Service Series

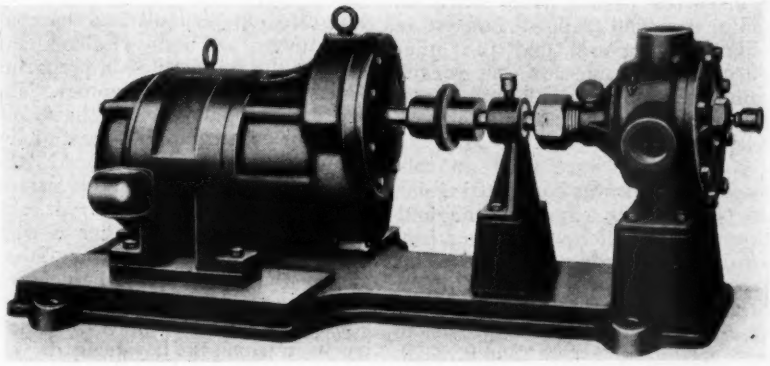
The seven articles in this series, published previously, include the following:

(1) Introduction (April issue)
(2) Sources of Supply—Streams, Lakes, Springs and Reservoirs (May)
(3) Sources of Supply—Wells (June)
(4) Sources of Supply—Pollution of Wells. Intakes, Suction Lines, Pump Pits, Ice (July)
(5) The Maintenance of Pumps — Reciprocating Pumps (August)
(6) The Maintenance of Pumps — Centrifugal Pumps (September)
(7) The Maintenance of Deep Well Pumps (October)

erly operated and maintained. Practically the only attention required is to maintain good steam and water connections, tight steam valves and good checks. The tubes should, of course, be kept free of obstructions and should be firmly seated, for loose tubes are sometimes the cause of injector failures. The principal cause of injector failures is worn or incrusted tubes. Therefore, when the tubes become worn to the extent that they impair the efficiency of the injector, they should be renewed.

When the injector and tubes become incrusted by deposits from the water, they should be cleaned by immersing them in an acid bath, consisting of one part of muriatic acid to six parts of water. The incrustation should never be scraped from the tubes with a sharp tool because of the possibility of damage to them.

An injector will not handle hot water satisfactorily for it will cause the injector to break because of loss of suction. Therefore, the temperature of the feed water should not be in excess of 100 deg. F. to secure best results.



Motor-Driven Rotary Pumps Are Widely Used for Miscellaneous Purposes

Portable Pumps

Power-driven portable pumps include diaphragm pumps, rotary pumps, reciprocating pumps and centrifugal pumps. They are self-contained units, and for convenience in handling they are mounted on skids, wheels and trucks of various designs. Their principal field of usefulness is for dewatering excavations and cofferdams and for similar purposes where it is necessary to handle large quantities of water. They are used extensively by water service gangs in both construction and maintenance work, and are sometimes utilized as emergency units at water stations during an interruption of the regular water service.

The diaphragm pump, as the name implies, utilizes a heavy rubber diaphragm to raise the water. A clapper type of valve is located in the center of the diaphragm, which closes with the upward movement of the diaphragm, thus permitting it to form a suction. As the diaphragm is pushed downward the valve opens, allowing them to be forced out. The open-top type of pump will not discharge the water above the level of the pump and it flows out through a wide spout which is a part of the pump. The closed-top or force-type of diaphragm pump operates in the same manner as the open-top type of pump but will discharge the water against heads of 30 to 50 ft.

Diaphragm pumps are chiefly hand-operated, but are also powered by gasoline engines. They are also adapted to use with electric motors when electricity is available. Because of their low speed, it is necessary to use speed reduction gears when they are power driven.

Portable reciprocating pumps may be of either the vertical or horizontal type, although the latter type predominates. These pumps range from the small single-cylinder hand-operated tank pump to the large duplex and triplex pumps powered with gasoline engines and in some cases by electric motors. The piston pump is not so well adapted to all-round service as a portable pump as either the diaphragm or the centrifugal pump for it will not handle very dirty water, sand and other debris successfully.

A Popular Pump

The modern self-priming centrifugal pump is rapidly replacing other types of portable pumps. It combines large capacity, compactness and ability to handle dirty water, will discharge the water against moderately high heads, and is readily adapted to use with high-speed engines and motors. The self-priming principle of the modern centrifugal pump is another factor that has increased its popularity. It is only necessary to fill the priming tank which is a part of the pump, and the pump will prime itself automatically by the recirculation of the priming water, even when air enters the suction while the pump is in operation.

Wide Range of Sizes

Portable centrifugal pumps are made in sizes and capacities ranging from 3,000 gal. to 125,000 gal. per hour. The weight of the smallest size is about 60 lb., as compared to nearly 3,000 lb. for the 125,000 gal. pump. The impellers are designed to handle trash and debris without interference. Some pumps of this type will pass a sphere one inch smaller than the suction opening.

Most of the portable centrifugal pumps in use are of the horizontal type, although vertical centrifugal pumps are used to some extent. The smaller pumps are powered by a gasoline engine similar to an outboard motor. The motor is connected direct to the pump shaft and the pump is usually immersed in the water. These pumps are adapted for use in dewatering sewer basins through manholes, basements or sumps and for similar service. They are adapted particularly for use in deep cofferdams and caissons. Another type of portable centrifugal pump is driven by an air motor which weighs less than 50 lb., and has a capacity of 6,000 gal. per hour against a head of 20 ft.

Portable pumps are strictly emergency equipment and should receive the best possible care and attention to insure that they are in servicable condition at all times. They are necessarily exposed to all kinds of weather and to a certain amount of abuse when in actual use. While of rugged construction and designed to operate under severe working conditions, their efficiency and dependability require intelligent operation and maintenance.

Maintenance Methods

The same methods that are employed in the maintenance of stationary pumps apply in general to portable pumps. However, the conditions under which portable pumps are operated necessitate special attention to certain details peculiar to pumps of this type. As with other work equipment, they should be kept clean, well-lubricated and protected in every possible way from damage due to weather conditions.

The engine or other power unit is usually provided with a housing to protect it from the weather. This housing should be maintained in good condition and kept closed. When the

pump is not in use, the pumping unit should be maintained in a level position and, if necessary, placed on a timber foundation to prevent strains because of settling and misalinement. If piping is used for suction or discharge, it should be supported in such manner that there will be no strain on the pump. Instructions issued by the manufacturer should be followed strictly in the operation of the pump.

If the pump is to be out of service for any length of time, it should be placed in good condition by the water department forces, and the pump and power unit protected against rust and corrosion. It should be drained of all water to prevent damage from freezing. The suction and discharge hose and connections should be kept with the pump and properly cared for. If at all possible, the pumping unit and all accessories should be covered.

Submersible Turbine

The submersible deep well turbine pump has been used as a semi-portable pump with excellent results on large dewatering jobs such as pumping out dry-docks and raising sunken ships, and can be used with equal success in dewatering large cofferdams and other projects where large quantities of water are to be handled. The submersible pump has the advantage that the motor, as well as the pump, is submerged, thus avoiding the necessity for removing the motor, or shortening or lengthening the line shaft when the pump is raised or lowered. Also, as there is nothing but the discharge line above the water, there is less equipment to interfere with the construction work, a feature which is sometimes of considerable importance.

A Battery of Four 8-In. Hydraulic Rams

High School Boys On Pere Marquette

(Continued from page 1129)

the older men in regular track gangs. They did all of the work except unloading the ballast, which was done by regular section forces. Later in the season one of the outstanding boys in each gang who showed exceptional promise was promoted to assistant foreman, thereby providing each gang with two assistant foremen. This pleased the boys and helped to enhance their morale. Except when working less than one-half mile from camp the boys were transported to and from work on motor cars and trailers. For use in obtaining line-ups, and for other purposes, the counselor's car at each camp was equipped with both a message telephone and a dispatcher's telephone.

No flagmen were used on this work. All of it was conducted under the protection of a general order and slow boards, which were moved forward as the work progressed. The general order placed a speed limit of 20 m.p.h. on the territory protected by slow boards, with the provision that each day, except Sunday, all trains must approach the gangs at restricted speed during the assigned working hours and come to a full stop unless given a proceed signal with a green flag.

The boys' work was very satisfactory. The foremen were instructed not to expect as much production from them as from experienced men. Usually the foreman assigned each boy or group of boys a goal based on what he thought was a fair day's work for them. Responding to this treatment, the boys did not loaf or play on the job. To show their regard for their foremen, they purchased presents for them at the close of the season.

Very little trouble was experienced due to misbehavior on the part of the boys. Two minor incidents occurred early in the summer, but after three boys were dismissed no other troubles arose. All boys were required to be in camp by 10 p.m. and in their bunks by 10:45 p.m., except that one night each week they were allowed to stay out an hour later so they could attend a moving picture. The boys themselves furnished the camp discipline under the leadership of the counselor and timekeeper, who assigned members of the group in rotation to police the camp. Each counselor worked out a merit system and made an inspection of the camp each day. Ratings based on these inspections were announced every day and posted on a bulletin board. By the time the camps were two days old, the boys at both of them had located and erected flagpoles. Thereafter, with appropriate ceremony, the flag was raised each morning and lowered at sundown each night. At the Holland camp the boys were wakened and the meals were called with a bugle, while at Breedsville a locomotive bell was used.

Recreation

Special efforts were made to promote the welfare of the boys, including ample provision for recreation. Since most of the boys were interested in football and baseball the towns at both Holland and Breedsville co-operated in preparing a nearby field for these games. The railroad supplied a few bats and balls for each camp, but most of the equipment used was furnished by the boys themselves. At both camps baseball teams were organized, each of which played several games with the team of the nearby town. Other games that were played included horseshoes and touch football. In addition, the railroad furnished trucks in which the boys were driven to a beach on Lake Michigan one night each week for a swim. As mentioned previously, they were allowed to go to the movie in town one night a week and, in addition, they would frequently walk to town for "cokes", candy, etc.

The counselor's office was equipped with a library which, at each camp, included 200 books loaned by the Grand Rapids Junior college. In addition, many of the boys brought radios or phonographs from home. Each week-end they were given transportation to return home on Saturday evening and back to the camp on Sunday evening.

As evidence that the camps were successful, the turnover during the summer was small; 32 boys out of the original 50 stayed all summer at Breedsville and 28 out of the original 50 stayed all summer at Holland. The Pere Marquette is well satisfied with the work done by the high school boys on its lines last summer, and particularly with the success of the boys' camps. The employment of the boys was under the general direction of H. A. Cassil, chief engineer, Detroit, Mich. The camps themselves were under the general supervision of C. J. Millikin, superintendent, and T. F. Burris, division engineer, both of Grand Rapids, and under the direct supervision of Mr. Lyon and Mr. Meyer.

Maul Blows on Webs Crack Rails at Low Temperatures

Tests conducted by A.A.R. research staff on wide range of sections show need for special care during cold weather to avoid damage

Cross Section Through Specimen No. 14, Showing Within the Circle the Crack and the Distance to Which It Progressed Through the Rail Web

THE fact that the webs of rails can be fractured readily in cold temperatures by heavy spike maul blows has been demonstrated clearly by laboratory tests completed recently by the research staff of the Association of American Railroads for the Rail committee of the American Railway Engineering Association. These tests, in which rails were chilled to a temperature of 20 deg. below zero and then struck on the web with a spike maul while at temperatures ranging from 13 deg. below zero to 25 deg. above zero, point to the danger of heavy blows on the web of a rail, particularly under low temperatures, at any time during its life.

The tests in question were conducted at Northwestern Technological Institute, Evanston, Ill., as a part of the Rail Design Investigation initiated by the Rail committee last year, with a program which calls for comprehensive stress measurements in track to determine the range and frequency of rail stresses developed in service and in laboratory tests, and to ascertain the fatigue strength of the rail web, with due consideration to the possible influence of corrosion, stamped letters, brand marks, etc.

Web Cracks Unexplained

During the last five years web cracks have been discovered in service with sufficient frequency to be the source of some concern. However, because they have been noted in considerable numbers only in a few locations, and because repeated stress measurements under actual service failed to disclose any excessive stresses in that part of the web where the cracks occurred, no explanation for the cause of these cracks received general acceptance.

In April, 1944, horizontal web cracks were discovered in twenty-five 112-lb. rails on an important main line of the New York, New Haven & Hartford, all within a distance of three-quarters of a mile, and because these rails had been laid during very cold weather, it was decided to study the effect of low temperatures on the impact resistance of the steel. Accordingly, two of the cracked rails were sent to the plant of the Bethlehem Steel Company at Steelton, Pa., for examination, where tests revealed the fact that horizontal cracks similar to those found on the New Haven could be produced by striking the web with a spike maul while the rail was at low temperature.

To verify these results was the purpose of the series of tests made by the research engineer of the Engineering division, A.A.R., at Northwestern, tests which were conducted on seven sections of rail ranging from 90-lb. to 152-lb. per yd., and in which cracks were produced in all of the sections by striking them with a spike maul when at rail temperatures ranging from 13 deg. below zero to 25 deg. above zero.

Use Laboratory Cold Room

The A.A.R. tests were made in two series, the first series including lengths of new 112-lb. RE and 131-lb. RE rails, and the second series including lengths of 90-lb. RA-A, 100-lb. RA, 105-lb. N.Y.C., 127-lb. N.Y.C. and 152-lb.P.S. rails. Each of these rails was cut into lengths approximately 5 ft. long, without bolt holes, and in this condition were sent to the Institute laboratory where they were placed in the laboratory's cold room—a fully insulated enclosure approximately 6 ft. high by 6 ft. wide and 7 ft. long. Here, in groups, they were cooled for several days to a temperature approximately 20 deg. below zero, as indicated by the continuous recording thermometer of the cold room. Subsequently, each section of rail was removed from the cold room and was struck by a heavy blow on the web with a spike maul. Immediately following, the temperature of the rail was measured by an electric thermo-couple and the side of the web opposite the blow was examined for cracks.

How Rail Was Supported

In most of the tests, the five-foot specimen was laid on its side on the concrete floor of the laboratory, and while the edge of the base lay flat on the concrete, wood blocks one inch thick were placed between the concrete and the head of the rail at each end of the specimen. This was considered as best simulating the support of the rail in track. However, in a few cases where the test was made with the rail upright on its base on the concrete floor, with no other support, the same type of fracture could be developed as when the specimens were tested on their sides.

In the first series of tests, which included both 112-lb. and 131-lb.

rails, the majority of the tests were conducted on 112-lb. specimens, which were from two different mills and involved A, C and D rails from these heats. In these tests it was the purpose to strike the web a single heavy blow with a spike maul. However, in a few cases the maul blows were misdirected, striking the lower or upper fillet areas, and where this was the case they were repeated until one well-directed blow struck the center of the web. The details of each test in this first series of tests are shown in the accompanying tabulation, the tests being numbered Fig. 8 through 31, since they exclude the first seven, which were of a preliminary nature.

As shown in this tabulation, cracks were produced in the webs of 10 of the 112-lb. RE specimens when struck at temperatures ranging from 13 deg. below zero to 19 deg. above zero. Nine of the 112-lb. specimens did not crack under the maul blow, this including four within the temperature range of —13 deg. to +19 deg., in which range cracks were produced readily in other specimens. No cracks were produced by the maul blows in any of the five specimens whose temperature was higher than 20 deg. above zero.

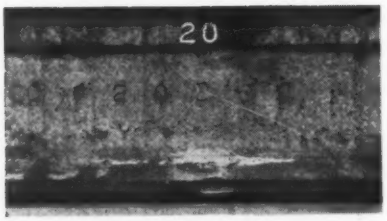
Of the five 131-lb. RE specimens tested, on each of which only one blow was struck, only one specimen cracked, this specimen being at a temperature of 12 deg. below zero at the time of the test.

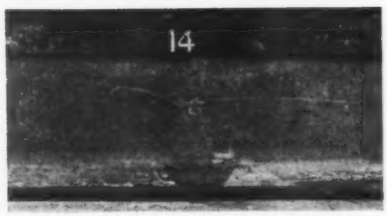
All of the cracks produced in the various specimens were visible to the naked eye, but for photographic purposes and to determine the full extent of the cracks, the specimens were magnetized and dusted with Magnaflux powder. The results are shown in the accompanying photographs.

Results of Maul Blow Tests on Cold Rail

Test No.	*Rail Sec.*	*Heat No.*	*Temp. at Time of Test*	*Striking Side*	*Opposite Side*	*No. of Blows*	*Web Cracked*
11	112 RE	420251 D13	−13°	Plain	Plain	1	Yes
9	"	420251 C9	−10°	"	"	1	No
10	"	420251 C9	−10°	"	Stamped	1	Yes
15	"	84063 A24	−10°	"	Plain	3 (2 high)	Yes
8	"	420251 D13	− 8°	"	Plain	4 (3 low)	Yes
13	"	420251 D13	0°	"	Brand	1	Yes
12	"	420251 C9	+ 3°	"	Plain	1	No
18	"	420251 D13	+ 4°	"	Stamped	1	Yes
19	"	420251 D13	+ 7°	"	Brand	1	No
20	"	420251 C9	+ 9°	"	Brand	1	Yes
14	"	84063 A24	+10°	"	Stamped	1	Yes
17	"	84063 A24	+16°	"	Plain	2 (1-low)	No
29	"	84063 A24	+16°	"	Brand	2-low, 1-high	Yes
16	"	420251 D13	+19°	"	Stamped	2 (1-low)	Yes
21	"	420251 C9	+21°	"	Brand	3 (low)	No
28	"	84063 A24	+22°	"	Stamped	3 (2-low)	No
27	"	420251 D13	+23°	"	Brand	1	No
31	"	84063 A24	+23°	"	Brand	1	No
22	"	420251 C9	+24°	"	Brand	2-low, 1-high	No
25	131 RE	34372 D22	−14°	"	Stamped Letter	1	No
23	"	34372 D22	−12°	"	Plain	1	Yes
26	"	34372 D22	− 1°	"	Brand	1	No
24	"	34372 D22	0°	"	Brand	1	No
30	"	34372 D22	+15°	"	Plain	1	No

Heat No. 420251 C9—CC—OH—Carnegie-Illinois, May, 1944.
Heat No. 420251 D13—CC—OH—Carnegie-Illinois, May, 1944.
Heat No. 84063 A24—CC—OH—Carnegie-Illinois, Feb. 1943.
Heat No. 34372 D22—CC—OH—Carnegie-Illinois, July, 1943.





Side Views of Six of the Rail Specimens Cracked in the Northwestern Tests

Specimen No. 11, 112-lb. rail, cracked at −13 deg.; Specimen No. 20, 112-lb. rail, cracked +9 deg.; Specimen No. 23, 131-lb. rail, cracked at −12 deg.; Specimen No. 14, 112-lb. rail, cracked at +10 deg.; Specimen No. 29, 112-lb. rail, cracked at +16 deg.; and Specimen No. 13, 112-lb. rail, cracked at 0 deg.

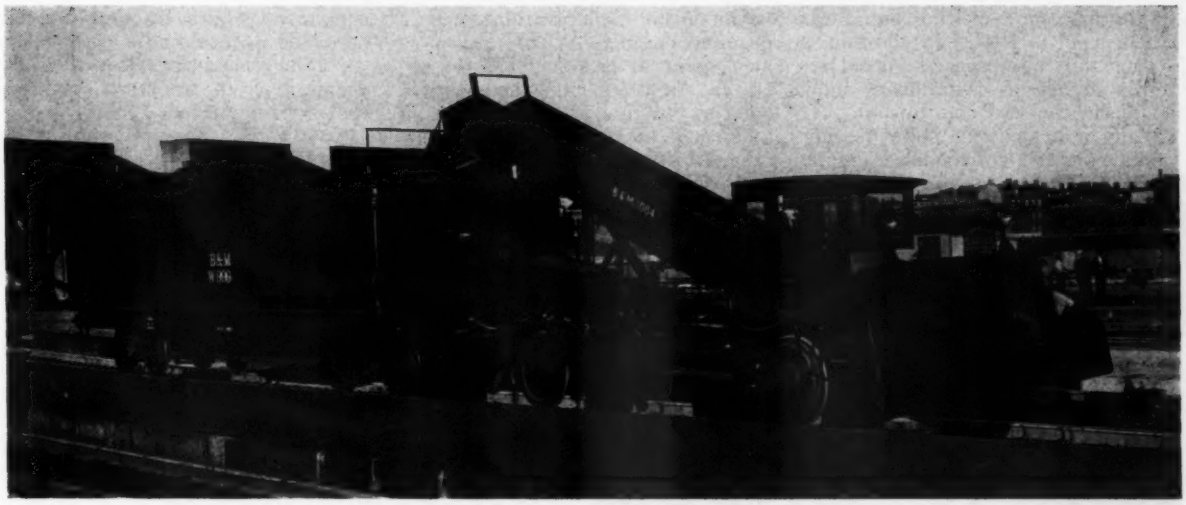
Tests Extended

The second series of tests made on specimens of 90 RA-A, 100 RA, 105 N.Y.C., 127 N.Y.C. and 152 P.S. rails were made for the purpose of determining to what extent, if any, rail design might influence the development of cracks from spike maul blows. This series of tests was conducted in a manner generally similar to the first series of tests but, if falure did not occur with the first spike maul blow, repeated blows were struck until failure did occur, or until a total of five or ten blows had been struck. Generally, however, if failure did not occur at the first blow, it was not produced by the following blows.

Tests Summarized

Summarizing this second series of tests, it was observed that cracks were produced in one or more specimens of all rail sections included in the tests. The 90 RA-A, 100 RA and 131 RE sections were cracked only at the lower temperatures within the range, but it was pointed out that this may not be significant since only one heat of steel was represented for each rail section.

(Continued on page 1140)



Snow Is Picked Up and Deposited in the Melting Tank by a Fox Snow Loader

Snow Melter Proves Worth at This Large Station

By T. G. SUGHRUE* and L. RICHARDSON†

The removal of snow from the platforms and tracks at busy passenger stations during heavy storms frequently presents a difficult problem. To cope with this problem at its North Station, Boston, Mass., the Boston & Maine developed a self-contained track-mounted melting unit that, during two winters of use, has shown itself to have many advantages over previous methods.

HEAVY falls of snow on the passenger platforms and tracks at the Boston & Maine's North Station, Boston, Mass., are being removed with greater efficiency and dispatch than ever before with the aid of a portable, track-mounted snow-melting outfit that is now entering its third winter of service. Pushed by a locomotive, which also furnishes steam for melting the snow, the equipment used consists of a snow-melting tank, converted from an engine tender, and a loading device, by means of which the snow is picked up from the track and deposited on a conveyor that discharges it into the melting tank. This equipment has many advantages compared with the methods of snow disposal that were used previously at this location.

The removal of snow from intensely congested operated areas, such as the platforms and tracks at large passenger stations, has always presented a difficult problem. The necessity of keeping traffic moving has made it difficult to obtain needed working room, especially during rush periods, resulting frequently in the elapse of considerable time between the end of a storm and completion of the snow-removal work. In general, the method employed to clear away snow at passenger stations has been to collect it into piles or windrows on the platforms or between the tracks until the storm ends, after which the task of removal begins. Unless reasonably rapid progress is made, a second storm may pile on top of the first one, possibly resulting in train delays.

In removing the snow by this method, the occupancy of tracks in pairs is usually required. On one track is placed the cars for receiving the snow, while the other track is occupied by the snow-loading equipment. The necessity of using the tracks in pairs means that many changes must be made in assigning tracks to incoming and outbound trains. These take planning and time. Much time is also lost in transferring the snow-handling equipment from one pair of tracks to another; while this is being done, three or four tracks are out of service. This is a severe operating handicap. When the cars have been loaded with snow they must be moved to the nearest convenient unloading point, and another set of empty cars must be secured and sent to the station for loading. Unloading equipment must also be available at the point of disposal.

With these considerations in mind, the B. & M. made a study of the problem, which led to the development of the snow-melting outfit. This equipment satisfies the requirement for a self-contained unit that requires the use of only one track and that entails a minimum of interference with regular train operation. Moreover, its use involves handling the snow only once instead of the several times required by the previous method.

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†Mechanical Assistant to Vice-President, Boston & Maine.

The first snow-melting outfit was constructed in 1941. In addition, a second unit has been completed recently for use as a stationary snow melter in the yards at Boston. As already indicated, the snow-melting tanks consist of remodeled engine tenders. To convert the tenders for this purpose, they were each divided into two principal compartments or tanks, one of which, the smaller, is used for heating the melting water, while the larger one is the melting tank. Steam from the locomotive, piped through a flexible connection to the snow melter, is used for heating the melting water. In the original unit the heating tank was divided into two compartments which were used alternately, but in the stationary melter one of these was eliminated when it was found that a single compartment provided sufficient heating capacity. The installation of an oil burner in the heating tank is being considered as a possible auxiliary method of heating the water, but this idea has not yet been fully developed.

Large-Capacity Dump Valves Permit the Melting Tank to Be Emptied Quickly

The Snow Loader

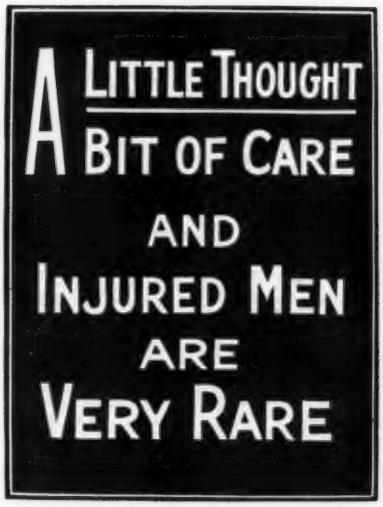
For picking up the snow and elevating it to the melting tank, a Fox snow loader is used. At its forward end, this machine, which is mounted on four flanged wheels, has a pick-up device consisting of a set of circular revolving knife blades that cut into the snow, breaking it up, and at the same time throwing it backward and inward toward the center of the track. In this action the snow is deposited on the lower end of an inclined endless conveyor, fitted with cross slats, which elevates the snow and dumps it into the melting tank. Both the pick-up device and the conveyor on the loader are driven by a gasoline engine. When the snow-melting outfit is assembled for operation, the three units comprising it, namely, the snow loader, the melting tank and the locomotive, are arranged in that order.

When a heavy snow storm occurs, the melting equipment is placed in operation shortly after the snow begins to fall. As the first step, sweepers and snow plows start work on the platforms. Instead of piling the snow into a center windrow on each platform, they throw it onto adjacent tracks. This permits the pick-up operation to start when the snowfall has reached a depth of only two or three inches. Getting this head start on a storm is an all-important factor in keeping ahead of the snowfall and preventing train delays. Since the melter requires only one track, it can start work on any open track or it can follow in on any track and remove snow from the outer platforms.

When snow drops into the melting tank from the conveyor it is melted almost immediately. Steam is drawn constantly from the locomotive to heat the water and permit rapid melting. Since 10 gal. of snow make 1 gal. of water, it can be seen that a capacity of 10,000 gal. in the heater will accommodate 100,000 gal. of snow—about 13,500 cu. ft. With the snow converted into water, its disposal is a simple matter. At North Station this is done by dumping the water into the Charles river nearby. Large dump valves located on each side of the tender permit a full tank to be emptied in a minute and twenty seconds. In fact, some dumping has been done with this equipment in motion. The cost of the fuel consumed in melting snow with the equipment is but a fraction of a cent per cubic yard. Because of the faster operation inherent in this method, the operating costs are much less than for previous methods.

How It Works

In the operation of the melter, the heating, or smaller, tank is filled with water as the unit starts into service. To heat this water, steam drawn from the locomotive is discharged directly into it, thereby eliminating the need for considerable piping. When the snow removal area is reached, the communicating valves are opened and the water is permitted to flow from the heating tank to the melting tank, the levels in the two compartments equalizing. As snow is dumped into the melting tank the water level rises, part of it backing up into the heating tank. This continues until both tanks are filled. Only enough steam is introduced into the melting tank to produce circulation and prevent the snow from piling up. When this tank becomes filled, the temperature should be close to 32 deg. F. so that no heat is wasted. At this point the communicating valve between the two tanks is closed and heating is continued uninterruptedly in the heating tank. Then, when the melter unit reaches a convenient location, such as a bridge, the dump valves are opened and the melting tank is emptied. When the dump valves are closed, the communicating valve is opened, permitting hot water to flow from the heating compartment into the melting compartment, and the cycle is repeated.



Poster No. 256, Which Is Being Distributed by the Committee on Education, Safety Section, A. A. R., as the November installment of the organization's "All the Year-Every Year Safety Program"

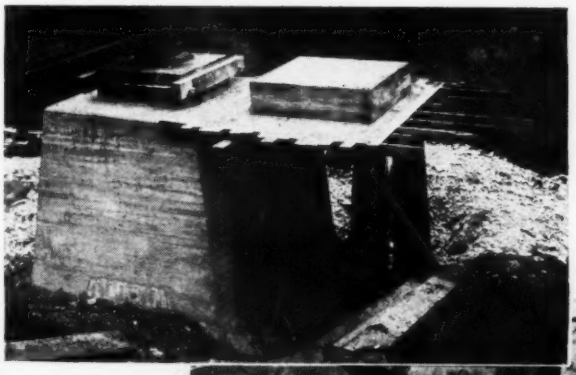
Renewing Pedestal Caps in Viaduct Towers

This work is simplified on the Nickel Plate by casting the new member on a platform adjacent to its final location and then moving it into position between trains

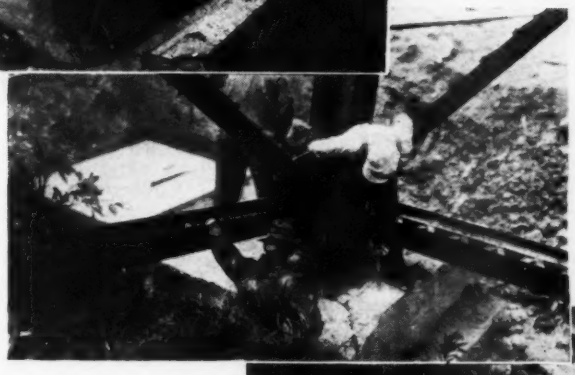
MASONRY cap blocks on pedestals under the columns of steel viaduct towers on the New York, Chicago & St. Louis are now being renewed where necessary by precasting the new caps on platforms directly adjacent to the pedestals, from which location it is a relatively simple matter to shift them into position under the columns. This expedient has been found to possess definite advantages as compared with the previous practice of precasting the cap blocks at some location removed from the point of installation.

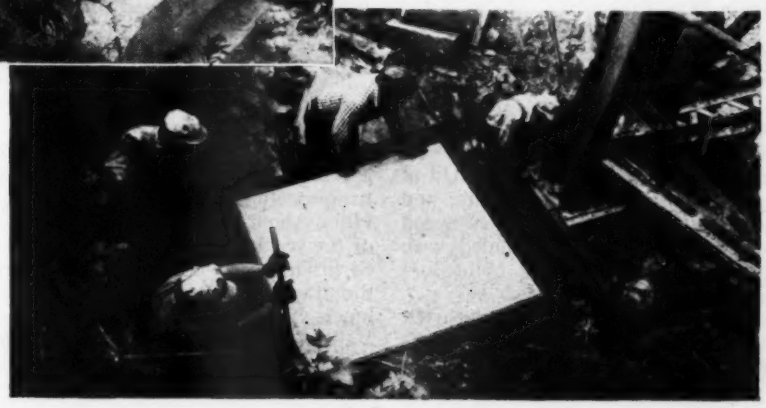
This road has a number of long steel viaducts on its main line, in which, as originally built, the columns in the towers were carried on stone masonry pedestals. Subsequently, many of the pedestals were strengthened by placing jackets of concrete around them. Eventually, deterioration of some of the pedestals occurred, due largely to the percolation of water into the crevices between the concrete jackets and the original masonry, and occasionally it has become necessary to make further repairs. This work has usually involved the renewal of the deteriorated portions of the concrete jackets and the replacement of the masonry caps with reinforced concrete blocks of sufficient size to overlap the joints between the old masonry and the new concrete in order to exclude water from these joints.

When making such repairs, the precasting of the concrete cap blocks has certain obvious advantages. As already indicated, the work of manufacturing the blocks was formerly carried out at a central point, but several years ago this practice was discarded in favor of casting each block directly adjacent to the pedestal on which it was to be installed. As the repairs are now made, the first step is to remove as much of the old concrete jacket as is found desirable, and then replace it with new concrete which is usually carried up to a level about four inches above the under side of the old masonry cap. Next, a timber platform is built directly adjacent to the pedestal at the level of the top of the new concrete, on which the new concrete cap is constructed.



Left—The New Caps Are Cast on Timber Platforms Built Adjacent to the Pedestals





Right—The Old Caps Are Removed With Pneumatic Concrete Breakers. Lower Right—Shifting a New Cap Block Into Its Final Position Under the Column

Embeco Used

In preparation for inserting the new cap, the old stone block is removed with pneumatic hammers and suitable blocking is placed under the base of the column. It should be noted

here that, since the new concrete jacket extends several inches above the under side of the old cap, the removal of the latter leaves a depression of corresponding depth in the top of the pedestal. Concurrently with the placing of the new cap, this depression is filled with concrete containing Embeco to prevent shrinkage.

Inserting the New Caps

The new caps are moved into position on the pedestals between trains. Preparatory to this operation, the load of the tower column is first transferred to two 50-ton jacks placed on the top of the pedestal at the opposite ends of a needle beam under the bottom cross strut. The blocking is then removed and the column jacked up to permit inserting the new cap. Meanwhile, the depression in the top surface of the pedestal, and the new concrete around it, are carefully cleaned of all loose material and dirt, using a blast from an air hose to remove the finer matter, and the depression is filled with concrete.

In preparation for rolling the new cap into position, two steel bars are inserted under it to serve as bearings for one-half inch steel rollers. Also, a chain is placed around the block and attached to a Coffing chain hoist which is anchored, in turn, to the steel work. With the aid of the hoist and crow bars, the block is then maneuvered into its final position, and the column is jacked down to a full bearing on it, thereby completing the operation except for minor details.

Foreman Fails to Flag, One Killed, Three Injured

ON February 29, 1944, a head-on collision between a track motor car and a mixed train on the Louisville & Nashville, near Springfield, Ky., resulted in the death of one employee and the injury of three others. This accident occurred on a curve of 7 deg. 12 min., around which the view was restricted to about 200 ft. by the side of the cut on the inside of the curve. It occurred on the Bardstown branch of the road, which extends 37 miles from Bardstown Junction to Springfield, the end of the line. The following information concerning this accident is abstracted from the report of the Interstate Commerce Commission.

Train Was Late

No. 36, a northbound, second-class train, consisting of the locomotive, one auxiliary water car, one empty tank car and one combination passenger-baggage car, in the order named, departed from Springfield at 1:05 p.m., 1 hr. 50 min, late, and while running at an estimated speed of 15 miles an hour, collided with the track motor car at a point 1.94 miles north of Springfield.

The track motor car departed southbound from Valley Hill, 5.43 miles north of Springfield, about 12:55 p.m. and, while moving at an estimated speed of 5 miles an hour, collided with No. 36. The motor car was demolished and the front end of the locomotive was damaged slightly. It was cloudy at the time of the accident. The employees killed and injured were members of a carpenter gang.

Rules Require Flagging

The rules governing the operation of motor cars on this line required that flag protection must be provided in territory where the view is obstructed. These rules also authorized operators of motor cars to obtain information, when practicable, concerning the movement of trains. Under the rules, however, operators were required to control the speed of motor cars at all times, so that they could be brought to a full stop within a distance of one-half the range of vision.

The carpenter force, consisting of a foreman and 12 men, was engaged temporarily in repair work at Valley Hill. About 12:55 p.m. on the day of the accident, the foreman instructed his men to put the motor car on the track to run to Springfield for lunch. There was no telephone at Valley Hill to enable him to get a line-up of trains. No. 36 was due out of Springfield at 11:15 a.m., but the foreman assumed that the gang would arrive at Springfield before the departure of No. 36, because No. 35, a southbound mixed train, had passed Valley Hill late on its schedule, and No. 36 was No. 35 turned to run northbound.

The foreman was familiar with the rules and understood that flag protection was necessary at points where the view was restricted. In fact, he instructed a member of the gang to provide flag protection. As the motor car was approaching the curve upon which the accident occurred, the foreman and the flagman were maintaining a lookout ahead. The speed of the motor car was reduced in preparation for the flagman to go ahead and flag. But the motor car over ran the point north of the north end of the curve, where the foreman intended to stop it to allow the flagman to alight. He then saw the approaching train about 200 ft. away, and immediately called a warning to the men on the motor car, and jumped just before the collision occurred. The fireman of No. 36 saw the motor car at about 200 ft. and called a warning to the engineer, who immediately applied the brakes in emergency, but the train was running at about 15 miles an hour when it hit the motor car.

As a result of its investigation, the Commission concluded that this accident would not have occurred if flag protection had been provided for the motor car in accordance with the rules in effect on the railroad.

Maul Blows on Webs Crack Rails

(Continued from page 1136)

Concerning all of the tests, it is of interest to note that cracks were produced irrespective of the branding, stamping, rail position in the ingot or rail section. It is also important to note that while a number of the maul blows left detectable marks on the rail web, those blows which were struck squarely left no discernible maul mark which might disclose the cause of the fracture.

The conclusion of the staff conducting the foregoing tests was that, "It may be concluded from these tests that it is entirely possible to produce cracks in the rail web by striking the web a heavy blow when at a low temperature"—a statement that has special significance for those handling or working about rail at low temperatures, whether at the mill or in track.

What's the ANSWER?

Winter Work for Track Labor

What means can be employed to keep track labor, including Mexican Nationals, employed productively during the winter months?

Not a New Question

By I. H. SCHRAM
Chief Engineer Maintenance of Way, Erie, Cleveland, Ohio

The question of keeping track labor employed productively during the winter months is one that, for many years, has engaged the attention of maintenance officers on railways in northern latitudes, which are so situated that they cannot move men above the number needed for safe and satisfactory operation, south far enough to enable them to engage in ballasting and other forms of track work. All roads in northern latitudes require some force in the winter to carry on the routine tasks of policing, keeping drains open, handling snow and ice, and for making repairs in case of wrecks or other accidents.

At this time, in most industrial districts, sections generally do not have their full quota of men and, since the section men handle the routine winter tasks, the first thought now is to fill out the sections, locating Mexican Nationals or other forces in camps from which they can be distributed as needed. In many cases this will require the employment of busses or covered trucks for distributing the men. It is well worth the effort, however, as it will insure safe and good-riding track.

There are several routine tasks, including gaging, renewal of tie plates, renewal of bolts, spikes and other track fixtures above the roadbed, with which frozen ballast and low temperatures do not interfere to any considerable extent, and these tasks can be undertaken during the winter months.

All yards, all terminals and most large station layouts have work that has accumulated during the last year, that has not been done during the normal working season because of lack of material or labor or both. This often includes renewals of frogs and switches, and the working over of bolts and spikes in sidings. There is also, generally, a considerably volume of rubbish, cinders and other waste material that accumulates at these places, which must be handled in the winter to avoid tieing up equipment with frozen material. It is an advantage to handle such wastes at this time with the extra forces mentioned. It seems evident that, with suitable planning and distribution of the tasks, a reasonable force can be employed productively and also be available in the event of storms, snowfalls or other emergency situations.

Depends on Management

By DIVISION ENGINEER

Whether labor will be employed productively on a given territory will depend in large measure in which part of the country the forces are to be employed. In the South, a considerable range of work can be done that cannot be accomplished either effectively or economically farther north. In the North, however, there are many opportunities to use labor that do not present themselves in the South. I speak particularly of keeping traffic moving during the storms of winter and the constant necessity for battling snow, ice and sleet. Handling snow and ice is not productive work, although it is essential.

Send your answers to any of the questions to the What's the Answer Editor. He will welcome also any questions you wish to have discussed.

To Be Answered In February

1. *What precautions in the use and care of track jacks tend to increase their service life? To what extent do these precautions also affect safety?*
2. *What fire-protection equipment should be provided at pump houses where electric motors or internal-combustion engines are in service?*
3. *To what extent can ties released from abandoned tracks be reused? Where? Should they be turned over? Why?*
4. *With what power tools should a bridge gang engaged in steel-bridge maintenance be equipped? For what operations is there an unfilled need for power tools?*
5. *To what extent are nicks serious when made by broken wheels on the heads of rails? On the bases? What action should be taken?*
6. *Under what conditions can electricity be used to thaw out water lines? How is it done? What are the advantages? The disadvantages? What precautions, if any, are necessary?*
7. *What provision should be made for picking up scrap in yards? During the winter? What immediate disposition should be made of it? Why? Does the size of the yard make any difference?*
8. *What is the most suitable floor for an enginehouse? What considerations are involved?*

If the winter is open, gaging can be done, although I am not in favor of withdrawing and redriving spikes in very cold weather, because a frozen tie splits easily and many will be damaged during periods of severe cold. It is better to do what gaging is necessary before winter sets in.

Owing to the shortage of labor which we have experienced during the year, we are somewhat behind on our rail program. Furthermore, we still have some rail due on our allotment, which will probably not be received before winter is upon us. In these circumstances I shall have no hesitation in laying the remainder of my rail during the winter months. Again, I expect to lay a considerable amount of released rail in sidings and yards, and to renew a large number of switches and frogs, so that, assuming a normal winter, I expect to complete a large amount of productive work. If we have severe winter with heavy snowfall, however, our energies may be dissipated in fighting snow.

It was stated at the beginning that the effectiveness with which labor will be employed will depend upon climate and latitude. While this is true, I want to emphasize that, regardless of climate or latitude, the amount of productive work that will be accomplished will depend in still larger measure on the quality of the management by the supervisor or roadmaster, and by the division engineer. If the work is not planned and executed with skill, the results will be disappointing, because much of the labor will be wasted in useless effort. Both planning and execution are more difficult than in the summer.

When Ice Gives Trouble in Tanks

When trouble is experienced with ice in tanks, what can be done to prevent float and altitude valves from becoming inoperative during periods of low temperature?

Float in Oil

By J. S. Eastman
Special Water Inspector, Chicago, Milwaukee, St. Paul & Pacific, Chicago

Accumulations of ice in storage tanks create difficulties in operating water facilities in cold weather and in many instances cause considerable damage to the insides of the tanks. Today, we have automatic-control equipment for treating and pumping water to tanks, which is dependable as long as the equipment is operative. The rate of flow of water to the tanks, the temperature of the water entering the tank, exterior temperatures and the uniformity of demand throughout the day, all have a bearing on the rapidity with which the ice will form.

Commonly, tanks have (1) an outlet spout, with a lifting rod to operate the outlet valve, (2) a float with a chain or cable to the exterior indicator, (3) a float switch to start and stop pumping equipment or (4) a float valve to control the entrance of water, or a combination of several of these. Any or all of this equipment can become frozen and locked in ice at the top of a tank, putting the water station out of service.

One remedy of particular value in preventing floats from freezing is to place them in tubes. These tubes should be 10 or 12 in. in diameter, open at both ends, extending vertically from near the tank floor to a point about 6 in. above the high-water level of the tank. The bottom of the tube should be placed 2 or 3 ft. above the floor, with steel legs to the floor for stable support. Sufficient thin oil to stand 24 to 36 in. in the tube should be poured in at the top. Floats can work in this oil with the chain running down inside the tube. Levers or other equipment can move up and down in a slot in the side of the tube near its bottom.

If the tank is emptied, the oil will escape from the tube and spread over the entire surface of the water. It can be skimmed off when the tank is filled again, and poured back into the tube. If oil is left on top of the water, it will cause any ice which forms to be soft and mushy. By placing a small quantity of oil between the mechanism of altitude valves and the water supply to which it is connected, the valve should be prevented from freezing.

Suggests Heating

By G. S. Crites
Division Engineer, Baltimore & Ohio, Baltimore, Md.

Tanks that are drawn on frequently do not freeze, since the water in them is kept circulating and is changed too often. Freezing occurs in little-used tanks at outlying points, especially where they are in exposed locations. If the density of traffic permits, water should be taken often enough to prevent the formation of ice. On some lines, where there are no Sunday trains, the tanks may be idle long enough to freeze, and should be protected against freezing. All tanks located where sub-freezing temperatures occur must have insulated frost chambers for the pipe inlets and outlets. If the temperature is likely to go more than 10 deg. below freezing, heat must be supplied to these frost chambers, since it will not only heat the water in the tanks but cause it to circulate and prevent a coating of ice at the top.

Electric heat is best, with gas next, since neither one requires much attention. If neither is available, an oil stove may be used, but this needs attention and is somewhat of a fire-hazard. Coke, charcoal, coal or wood for heating require an attendant. On branch lines of light traffic, none of those expedients may be justified, so that the valves and valve stems must be freed by hand from time to time.

Location Is Important

By C. R. Knowles
Superintendent Water Service (Retired), Illinois Central, Chicago

The location of the float valve is important. It should be placed well above the bottom and near the center of the tank, to prevent interference from ice that may form on the sides of the tank. Yet, it should be low enough to be submerged at all times. The floats present a more difficult problem, as they must rise and fall with the water, and will become inoperative where ice forms a solid sheet over the top of the water in the tank. The most practical method of keeping them in operation is to keep the water in the tank above freezing. It will be of help to chain them to the top of the tank, allowing only enough movement to permit the valve to open and close. In severe climates, tanks are usually heated by stoves located in a frost box, with the stove pipe passing through the water in the tank. In some cases, particularly in Canada and the extreme northern sections of the United States, the entire tank is enclosed and is heated by stoves or other means. Altitude valves should be placed in frost-proof pits.

Troubles from ice are not confined to the freezing of float valves. Falling ice during thaws sometimes causes damage to piping, valves and valve operating mechanisms. This is especially true of steel tanks and where

water is taken directly from the tank. Much of this trouble can be avoided if the tank is kept filled, for the falling ice causes the most damage when the tank is almost empty.

Outlet valves and pipe sometimes cause trouble from freezing. Less difficulty will be experienced from ice where the daily consumption at least equals the capacity of the tank. Again, prolonged temperatures in the low twenties will cause more trouble than a short period of much lower temperatures. Little difficulty will be experienced where water is obtained from wells, springs and other underground sources, because they are rarely below 50 deg., while surface sources may approximate freezing temperature when they enter the tank.

Draining Railway Crossings

What measures can be taken to insure adequate drainage at railway crossings? Where natural drainage is lacking?

Careful Attention Needed

By Supervisor of Track

In general, the opportunities to drain a railway crossing do not differ from those available to the remainder of the track in the vicinity. The endeavor should be to limit the amount of water coming to the crossing area to that which falls directly upon it, and to shed as much of the latter as practicable. However, the provisions for drainage at the crossing must be somewhat more elaborate than those for ordinary track, because of the more severe service to which the crossings are subjected, and of the large amount of coal, sand and other material that is jarred from cars as they pound across the crossings. Furthermore, the drainage at crossings must be reconditioned at shorter intervals.

It is essential that the subgrade at the crossing be kept dry and the ballast clean. The ballast should consist of a deep layer of sub-ballast and a top ballast that is somewhat smaller than that for ordinary track. The drains should be deep enough to insure a dry stable support for the subballast. Where there is a grade descending toward the crossing, several lateral drains should be installed at intervals of 50 to 75 ft. above the crossing to intercept any water that may flow toward the crossing.

Simple in Theory

By George Stafford
Section Foreman, Canadian National.
Redland, Alta.

Adequate drainage is usually comparatively simple, at least in theory, for single-track crossings, so that an elaborate system of drainage is seldom needed. If the crossing is on an embankment built of stable material, little provision for drainage will be required. If in a cut, pipe culverts of 8-in. or 12-in. corrugated pipe can be installed in conjunction with the side ditches of the cuts. Any indication of churning in summer or of heaving in winter should be investigated by sounding, as these signs point to the presence of water pockets in the subgrade. This condition can be remedied by excavation and back filling with washed gravel and possibly the addition of French or tile drains. If the condition is extensive and has reached the chronic stage, the need of a sub-ballast slab may be indicated.

Drainage for multiple crossings is more complicated. Where subsoil conditions are not satisfactory, provision will have to be made for a series of lateral and longitudinal drains and for cleaning them. Surface water should be drawn off by means of catch basins in the inter-track spaces in the vicinity of the crossing. These basins should be interconnected by 6-in. or 8-in. corrugated pipe to facilitate drainage to a main sump outside the limits of the crossing area, with an outlet to carry the water away from the roadbed.

The first consideration is to keep the foundation of the crossing dry. Again, sufficient ballast of satisfactory quality is an essential requisite for railway crossings. It should be coarse enough to permit satisfactory drainage, yet fine enough to insure solid tamping. It should not be easily abraded or disintegrated by the weather. It is of primary importance that the ballast be kept clean during the service life of the crossing.

Using Tie Tampers in Winter

What practical use, if any, can be made of tie tamping equipment during the winter? Does this differ for the several forms of power employed?

Finds Many Uses

By C. H. Ordas
Supervisor of Motor Cars, Chicago, Milwaukee, St. Paul & Pacific, Chicago

In some sections of the country, where the tamping of ties is suspended during the winter because of frozen ballast and roadbed, it has been found possible to make good use of the equipment used for tamping ties. The power plants on these outfits generally are of the gasoline-electric, motor-electric, gasoline-compressor or Diesel-compressor types, in addition to which many tampers of the self-powered unit type are in service.

Electric power plants, regardless of the method of generation, furnish the current through cables, and in the pneumatic plants the air is distributed through pipe and hose, to the tamping tools. The self-powered unit tampers are equipped with internal combustion cylinders, in which the expanded gases actuate the pistons which strike the tamper bars or hammers.

Any electric or pneumatic hand tool having the correct characteristics for operation with the power plant may be used to perform many useful operations, using the desired tamping bar, drill, auger, etc., as may be required for the work to be done. Where the power plant and tools do not have matching characteristics, they can be matched through the use of transformers, rheostats and air reducers or regulators.

Vibratory and impact tampers using the desired bars, blades or forks will be useful in breaking up ice and frozen material at stations, platforms, water columns, tanks and track pans and in flangeways at switches and grade crossings, and for drainage. These tools have also been used for breaking up frozen cinders, coal and other materials in cars that must be unloaded. They can also be used as concrete busters, clay diggers, for drilling blasting holes, while the power plants can be used for the operation of portable hand tools, such as drills, wood borers, grinders, buffers, saws, power wrenches and other tools for a wide variety of work.

Within their capacity, the generat-

ing plants can be utilized for floodlighting at wrecks and washouts, in labor camps, and even at stations and in yards in emergencies. The compressors can also be used for sandblasting and, with suitable reducing valves, for spray painting. In fact, the variety of jobs upon which tie-tamping outfits, or their power plants separately, can be used to advantage is so great that alert and ingenious maintenance officers can keep them employed throughout the off season.

Can Be Made Useful

By District Engineer

It has been a matter of wonder to me that more use has not been made of tamping equipment during the winter months, for this equipment can be made very useful for many purposes other than that for which it was designed. Tie-tamping tools of the impact type, when fitted with suitable bars, points or forks, can be used as concrete breakers, for chipping and breaking ice, to break up frozen material, such as cinders, sand and rubbish, that must be unloaded from cars, and for other similar purposes. The vibratory type of tool is also suited for some of these jobs, but I am not quite as familiar with its possibilities as with those of the impact tools.

In general, the power plants have a somewhat wider application than the individual tools. The generator for the electric-driven tamper, for example, can be used to provide light for gangs engaged in either emergency work or in jobs that must be done at night when traffic is suspended or is lightest. Power plants of both the pneumatic and electric types can be used to operate a wide variety of small portable power tools, such as drills, grinders, saws, power wrenches, impact wrenches, winches, air hoists and many others, including those for sand blasting and spray painting. In fact, the variety of work possible with this type of equipment can be enlarged surprisingly if the officer in charge is ingenious.

Does the type of power make any difference? Obviously, a compressor is not suitable to run a lighting plant or a generator for sand-blasting service; in other words, there are certain kinds of work that a compressor plant or a generator plant cannot perform. But aside from these few jobs, both types are able to perform about the same service, provided suitable tools and accessories, such as transformers, reducing valves, etc., are employed to adjust the power to the characteristics of the tools available.

Misusing Fire Extinguishers

In what ways are fire extinguishers misused? How can this be overcome?

Lack of Care

By G. S. Crites
Division Engineer, Baltimore & Ohio, Baltimore, Md.

Fire extinguishers come in the same category as wrecking cranes and first-aid devices and supplies, for they are emergency equipment which is usually forgotten while they are not needed, but they are needed badly when the need for them occurs. In general their misuse arises more from neglect than from other causes. Because it is hoped that there will be no occasion to use them, which happens in 99 cases out of 100, they are often not cared for as they should be.

Fire extinguishers must be readily available when needed, but this does not mean that they should be in a place where they may be hit, toppled over or damaged; neither does it mean that they should be out in the open where they will be subjected to dust, corrosive action of the elements or other forms of natural or accelerated deterioration. Furthermore, they should not be exposed to either high or low temperatures.

It is best to place fire extinguishers in accessible dust-proof and frost-proof receptacles, and then follow directions as to how and when they should be charged and recharged, as well as how to care for them. The persons responsible for fire extinguishers should be expected, within reason, to be available to look after them periodically for a long time. Wrecking masters are not changed frequently, for their value to the railway increases with their experience; for the same reason, those who look after fire extinguishers should retain this duty as long as practicable.

As a rule, fire extinguishers do not receive direct or deliberate abuse, although the treatment that many of them receive produces the same results as if they had been damaged deliberately. I have seen, through pure carelessness, fire extinguishers pushed or knocked off a shelf to the floor, with the result that they were dented, distorted and otherwise damaged, sometimes beyond repair, and the contents discharged. No extinguisher should be placed where boxes, bales or other packages or materials can be piled around it, so that it will not be accessible when needed or where it may be damaged in the manner described. I have also seen extinguishers that had been damaged by heavy objects falling upon them, several of which had been punctured.

Neglect and Carelessness

By W. F. Hickey
Superintendent of Insurance, New York, New Haven & Hartford, New Haven, Conn.

Probably the greatest amount of abuse to which fire extinguishers are subjected arises from neglect. Normally, their use is required so infrequently that they are given little thought or attention. As the extinguisher ages, it loses its high polish, which is only an indication of far more important details of neglect to which it is exposed. It may not be recharged, except at long intervals; the hose may deteriorate and become a liability instead of an asset, or it may become clogged with solidified soda; worn gaskets may not be replaced; or the extinguisher may be damaged by exposure to freezing temperatures.

Another form of abuse comes from a lack of understanding on the part of some of the personnel responsible for the equipment, about how the various types of extinguishers should be used and operated for different fires. They sometimes fail to realize that any form of fire extinguisher should be considered only as first-aid equipment in case a fire occurs, and that there should be no delay in calling the municipal fire department if the fire cannot be checked immediately through the use of the equipment at hand.

Lack of attention to the regular dates for recharging, which many look upon as unnecessary, may make the extinguisher inoperative when it is needed most and lead to serious fire.

Extinguishers of the pump-tank type are sometimes used for spraying insecticides, some of which are inflammable. The use of the contents of carbon tetrachloride extinguishers for non-authorized purposes, generally for cleaning apparel, without replenishing, is a common form of abuse and is often the reason why the insurance inspector frequently finds an extinguisher empty, and thus a liability instead of a protec-

tive device. Only through constant supervision on the part of the inspector and application of dicipline can this practice be eliminated permanently.

Supervision Needed

By Supervisor Bridges and Buildings

Probably one of the most frequent forms of damage encountered is deterioration of the hose, which might make the extinguisher inoperative when needed. The only way to overcome the trouble is to make the supervision as nearly complete and constant as practicable. The men who are responsible directly for the care of the extinguishers have many other duties to perform and most of them never had a fire, so that where no pressure is brought to bear upon them, they simply neglect this duty. Shortly after I came to this division I made a fire inspection and was astonished at the evident neglect of the extinguishers. I talked the matter over with the division engineer and we reported it to the superintendent and got his backing. Then we bought a number of new extinguishers to replace an equal number of damaged ones, which were brought in for overhauling. Those that could be made serviceable were reclaimed; the others were scrapped and sufficient new ones purchased to give us first-class equipment. We put on a regular inspector who patiently taught agents, foremen and others who were responsible for the equipment, how it should be handled and cared for. The men became interested and most of them responded favorably. We were patient with the others, but if they did not "come through" within a reasonable time we "got tough," then reported the matter to the superintendent who used his authority to straighten them out. Today we rarely find an abused or neglected fire extinguisher on the division and our carbon tetrachloride extinguishers are no longer emptied to obtain cleaning fluid.

Renewing Ballast-Deck Trestles

To minimize delays to trains, what procedure should be followed in renewing a ballast-deck trestle? In changing from an open deck to a ballast deck?

Gives Complete Sequence

By A. B. Chapman
Bridge Engineer, Chicago, Milwaukee, St. Paul & Pacific, Chicago

When renewing a ballast-deck trestle, it is assumed that the bents, as well as the deck, are to be renewed. On this basis the first action will be to remove the ballast and about two-thirds of the planking, placing longitudinal timbers under or slightly outside each rail, using the remaining cross plank to distribute the load to the stringers. If it is "fast" track, and it is necessary to maintain a good surface, shims will be required under the track ties, for they are usually of unequal depth. The time between trains will dictate how much of the ballast can be removed and how much blocking placed before closing for traffic.

After the track has been supported in this manner the stringers should be shifted and those not needed for strength should be removed to permit driving the new piles and placing the new caps to receive the new floor. Following this, the old stringers are replaced with new stringers, using short lengths of the old ones to close for traffic. The next move should be to place new floor plank and ballast retainers on the entire trestle, replacing such of the track ties as need renewal, then shift the longitudinal timbers toward the ends of the ties to provide space for dumping the ballast. Then dump the ballast in the center of the track and tamp the ties. As the last operation, cut the old piles off at or below the ground line and remove all old and unused material from the site.

In many cases, if the ballast removed from the old structure is dumped on the ground under the structure, the effective waterway may be reduced to the point where it might cause a washout. A good rule to follow is to dispose of the old ballast along the embankment at the ends of the trestle, or spread it evenly downstream from the structure.

To change from an open-deck to a ballast-deck trestle, the new piles should be driven and the caps applied at the correct elevation. In many cases, the waterway requirements demand that the bottom of the new timber floor be placed at about the same elevation as the existing stringers, or that the length of the trestle be increased. If the bottoms of the new stringers are to be at the elevation of the old ones, the work will have to be co-ordinated with the track forces to make the ballast lifts at the ends of the structure necessary to meet the raise that is to be made on the trestle.

In this case, after the bents are driven and capped, place the stringers and support the trestle ties upon them. Generally, shimming will not be required, for the trestle ties are usually surfaced to an even depth. Boat spikes or drift bolts must not be driven through the ties and into the new creosoted stringers for this will shorten the life of the new creosoted deck. The ties should be prevented from bunching or shifting by a spacer timber, which may be a 2-in. by 8-in. or a 3-in. by 8-in. plank spiked to each tie.

Next, lift the track, as necessary, to place the cross or floor plank the full length of the trestle. Then remove the old trestle ties and place the new track ties and ballast-retaining timbers. Finally, dump the ballast and lift the track to the required elevation.

If the new track elevation is to be the same as the old one, remove the old stringers and place the new ones and the cross plank at the lower depth, with longitudinal blocking for the entire height slightly outside the running rail for the whole length of the trestle. Replace the trestle ties with track ties and place the ballast retainers. Next, place the ballast inside the rails and tamp the ties. Finally, remove the longitudinal blocking timbers and place the remainder of the ballast, tamp and surface the track to final grade. As the last operation, cut off all old piles at or below the ground surface and remove all material and equipment from the site.

Do Not Delay Trains

By L. G. Byrd
Supervisor Bridges and Buildings, Missouri Pacific, Poplar Bluff, Mo.

It is always more economical to delay a bridge gang or bridge work than to delay traffic, and this is particularly so at this time when uninterrupted movement is so important. Ten minutes delay of a train may cause connections to be missed at junctions or terminals and may result in hours of delay to the lading.

In renewing a ballast-deck trestle or in changing from an open deck to a ballast deck, the procedure will depend largely on the class of track on which the trestle is located and the height of the structure. It has been our practice when changing structures from open deck to ballast deck on heavy-traffic lines to construct temporary falsework at one side of the

old structure and build a complete deck on the falsework, if the length is more than 60 ft. and the height not more than 25 ft. If the trestle is a long one, the new deck should be built on the falsework in sections of not more than 500 ft. After the new deck has been completed, except the ballast retainers on the side adjacent to the old structure, it is jacked into place, pushing the old deck out. If careful planning and thorough preparation for the movement have been made in advance, the 500-ft. section of trestle can be made ready for traffic in from 1 hr. 50 min. to 2 hr. If the intervals between trains are less than this, the sections of the deck should be shortened, in some cases to not more than 130 ft.

Before the jacking operation is started, all bolts and drift bolts should be removed from the old structure, except enough to keep it safe for the passage of trains until the jacking operation is started. Then, immediately following the last train, all drift bolts should be pulled and all packing bolts removed from the line of stringers opposite the new deck. If time does not permit the deck to be completed before the arrival of the next train, the bridge can be made safe quickly to allow the train to pass, because, while one line of stringers will have been pushed off the old structure but the other line will still be intact on the bents. When changing from an open deck to a ballast deck, by the jacking method, it is advisable to cut the old bents down so that the caps will be about 2 in. lower than those on the new bents, placing short blocks under the stringers, thus keeping the old bents intact.

When renewing a ballast-deck trestle, it is expected that the new deck will be placed on new bents and that it will be necessary to renew the ballast decking boards and space the stringers for driving the piles for the new bents, which will be at the same elevation as or slightly higher than the old bents, so that it will not be necessary to disturb the old bents. The nailing of the floor boards and the placing of bolts through the ballast retainers on one side can be completed before the jacking is started. Where the trestle is 25 ft. or less in height, the work can be done by this method at less cost than where one or two panels are completed in place at one time. There is some fire hazard connected with renewing a ballast deck so that as a section is completed it should be covered with ballast to guard against fire.

Recently, we replaced an open deck with a ballast deck on one of our important high-speed lines. The total length was 478 ft., and it was jacked into place, pushing the old deck out, and was made safe for traffic in 1 hr. 45 min. A slow order, 30 miles an hour, was placed on this structure and remained in effect for only 30 hr. If the deck had been renewed in place, two panels at a time, the slow order would have been in effect for about 10 days leading to train delays.

Conveying Steam and Hot Water

Where steam or hot water is available at a central power plant, how far is it practicable or economical to pipe it for heating purposes? What considerations are involved?

Limitation Indefinite

By C. R. Knowles
Superintendent Water Service (Retired), Illinois Central, Chicago

It is difficult to make a general statement placing a definite limit on the distance that either steam or hot water can be piped, because of the number of factors involved. From a practical standpoint it may be piped great distances, provided the pipe lines are constructed carefully and insulated fully. However, the question of economy must be considered, and this may limit the pipe lines to comparatively short distances.

There are railway installations where both steam and hot water are piped for a distance of a mile or more. Central heating systems may comprise several miles of pipe. Some of these systems utilize waste steam from generating stations that would be lost otherwise. In other cases, central heating plants utilizing live steam are maintained solely for supplying steam for heating purposes.

Access to a railway track for unloading fuel is sometimes an important factor in determining the location of the boiler plant. For example, the power plants of the University of Illinois and the University of Chicago, both coal-burning plants, are located more than a mile from the buildings they serve. In both cases it was more economical to locate the plant on a railway siding and pipe the steam a long distance than to truck the coal to the point where the steam is used. However, where track frontage is available at or near the points of use, the operation of two boiler plants may be less than the cost of constructing and maintaining long pipe lines.

Often overlooked, especially when extensions are made to existing systems, the type of construction and methods of insulation are important factors in the operation of piping systems for steam and hot water. Unless these extensions are designed correctly, and the same can be said about a main piping system, they may be extremely wasteful of steam and even impair the value and efficiency of the main system. Whenever conditions permit the lines should be above ground, as this will prove to be most economical and satisfactory in both construction and maintenance. The only satisfactory method of laying steam and hot water lines underground is to place them in pipe tunnels where they can be protected from ground water and where they can be inspected and repaired readily. However, in any event, adequate insulation is essential to prevent heat losses. Adequate provision for expansion is also essential.

Depends on Volume

By General Inspector of Buildings

From a physical standpoint the transmission of steam or hot water is not particularly difficult, if certain basic principles are observed, although under some conditions the practice may be quite expensive. I do not know what the extreme limit for this transmission is from the physical standpoint, as I have seen steam lines that were upwards of two miles in length that functioned at a relatively high efficiency. I have also seen such lines only a few hundred feet in length that were being operated at surprisingly low efficiency with much waste of steam.

In general, the distance that steam and hot water can be piped effectively will depend largely on the volume to be handled and the initial temperature of the steam or water. Obviously, the expense of transporting a small volume of steam at relatively low temperature will cost more per unit of volume than when transporting a large volume at high temperature, for the cost of the pipe line and appurtenances will be comparable, so that the overhead expense of the pipe line will be a heavy burden where the use is small. Furthermore, the cost of generation for the large volume will be for less per unit. If conditions require the use of a pipe tunnel, the cost may be prohibitive where only a small volume is involved.

Both high-pressure steam and hot-water lines should be placed above ground wherever possible, for the cost will be lower, and inspection and maintenance will be facilitated. Whatever the location of the pipes, however, it is essential that they be completely and thoroughly insulated to prevent loss of heat. That this can be done effectively has been demonstrated in many instances. I recall having seen an 8-in. high-pressure steam line, on a cold morning, about —10 deg., that was supported on the outside wall of a shop building, where it had been subjected to drip from the roof during a thaw the previous day and evening. The pipe had been insulated so well that it had icicles more than 2 ft. long hanging from it, in spite of the fact that it was carrying live steam at 150 lb. pressure. In general, economy will have more to do with the decision to build or not to build the pipe line than any physical difficulties of transportation.

Assigning Seats on Motor Cars

Should seats on a track motor car be assigned to members of the gang? What duties should be assigned to each man? Why?

Doubts the Advantage

By E. L. Henry
Superintendent of Safety, Chicago & North Western, Chicago

In the ordinary section gang the men are not assigned to certain positions or seats on motor cars and I doubt whether there is any particular advantage in doing so. In extra gangs where motor cars and trailers are used to transport the gang, certain employees are chosen and directed to ride one to each trailer. The usual instructions apply in all cases, namely, that a good lookout must be kept in both directions and, to do this, men must be seated so that some will be facing forward and some will be facing backward.

Men Appreciate Assignment

By W. O. Frame
Superintendent, Fort Worth & Denver City, Wichita Falls, Tex.

Assigning seat locations on track motor cars used to transport track or bridge and building gangs is definitely a part of good gang organization. To get the advantages out of such assignment, there should be also an assignment of duty to certain of the men who can be so seated that they will be in position to fulfill their duties.

If the foreman operates the motor car, he will of necessity face forward. Opposite him, should be seated the man selected to assist him in observing the track, watching for traffic at street and highway crossings and for live stock on the right of way. One man should be seated at the rear facing the rear to watch for following trains. One man seated on each side of the car should ascertain that the tools are loaded correctly and insure that they ride safely. Additional members of the gang will be seated between those in assigned seats, without specified duties.

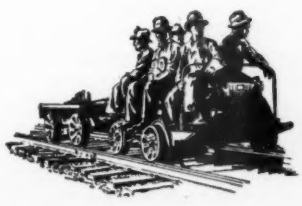
In extra gangs, the turnover is generally at such a rate that only a few members of the gang will be of any value for carrying out assigned duties. However, one man should be assigned to each trailer to control the brakes. If there is another reliable man, he should be assigned to see that other men riding on the trailer are seated correctly and that they remain so when the car is moving.

It has been my experience that men in regular section and bridge and building gangs appreciate these special assignments and are glad of the opportunity to share some of the responsibilities with their foremen.

Sees Definite Advantages

By J. E. Fanning
Assistant to Chief Engineer, Illinois Central, Chicago

There are advantages in assigning seats or positions on motor cars to certain members of gangs. The operator should occupy a place where he can handle the motor controls and brakes and have a clear view ahead.



The rules governing the operation of motor cars should provide that at least one man keep a sharp lookout to the rear for following trains and the man selected should be permitted to sit where he can do so.

The method of starting motor cars today is to push them along the track, making it necessary for those doing this to board the car from the rear. Incidentally, the boarding of motor cars should always be done from the rear, never from the front or sides.

It is advisable that the individual members of each gang be advised as to the particular part he is to play in removing the car from the track. The best results can be obtained by careful arrangements of the men on the car and it will be found that the alert foreman will have his men so located that they will act as a team in an emergency. Obviously, this is quite necessary in the elimination of accidents to gang members.

Assignments Are Essential

By Harry L. Mills
Section Foreman, Tennessee, Coal, Iron and Railroad Company, Birmingham, Ala.

Any foreman who expects to have a well-organized gang will have his men trained to the motor car as well as to the work. He will, therefore, recognize it as essential that each man be assigned to a seat on the motor car. Each man should also have certain duties while on the car and should be trained to perform them in an emergency as well as in routine operation. For instance, if a train shows up unexpectedly, the men should be trained sufficiently to remain cool, to step off the car and to remove it from the track, without getting excited. Otherwise, no matter how experienced they are, some one is likely to stumble and endanger the others.

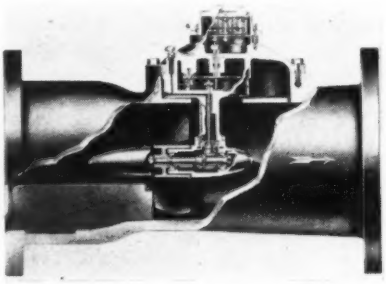
The two men riding at the front of the car should be instructed to be on the lookout for trains, for broken rails, for bolts that are out of joints and for objects on the rail that might derail the car. They should also watch for cars and other vehicles at grade crossings. The men who are seated at the middle of the car should be assigned to be on the lookout for broken telegraph, telephone and signal wires, for broken fences and for scrap along the right of way. Those who are seated at the rear should face the rear so they can watch for following trains and not allow them to slip up on the motor car, causing personal injuries either in the event of a collision or in taking the car off the track in a hurry.

New Device

New Flow Meter

Builders-Providence, Inc., Providence, R. I., a division of the Builders Iron Foundry, has announced a new propeller-type flow meter for main-line metering, which incorporates a number of improvements, including streamline Venturi construction. This unit, called a Propeloflo meter, has an eight-blade bakelite propeller molded in one piece. Rotation is transmitted through spur and bevel gears, and shafts rotating in ball bearings are said to assure maximum power to drive indicating and recording devices or proportioning chemical feeders. A Venturi throat distributes the force of the flow against the full area of the propeller, resulting, it is claimed, in proved accuracy throughout a wide range of flows. Spiral flow is eliminated by straightening vanes located immediately upstream of the propeller.

The propeller hub, bracket and nose are streamlined to reduce flow disturbances and divert fine grit, sand or scale away from the mechanism. The unit is said to be readily serviced because of its "one-shot" lubrication system, a readily-accessible stuffing box, and the ease with which the propeller mechanism may be removed from the line for inspection. A blank cover may be installed when the meter is removed. For locations where debris or heavy foreign material may be carried along the line with the moving fluid, the manufacturers can furnish a section of pipe having a coarse screen and hand hole, to be inserted upstream from the meter. The meter is said to provide wide range, accuracy and low pressure losses in the measurement of liquid flows in lines two inches and larger in diameter.



The Meter Has an Eight Blade Propeller Molded in One Piece

What Our Readers Think

Urges Railroad Schools for Boys

Vancouver, B. C.

To the Editor:

As the war progresses we can expect increasing difficulty in obtaining the man-power needed for railway work, and it is certain that it will be a real task to fill these needs four or five years from now unless we start thinking more seriously about the 16-year-old lads now. For this reason, I suggest that the problem of future railway employment be attacked immediately.

I have given vocational guidance to about 4,000 boys to whom I have taught manual training over a period of 30 years, including work in metal, wood, electricity, drafting and science. As a result of this experience, I know that many boys are deeply interested in railway work, but have no associations through which they might be led into railway employment. As a rule other jobs are easily available and in taking them the boys are lost to the railways.

According to the latest census information, there are about 1,200,000 boys 16 years old in Canada and the United States. I believe that the railways can get their share of these boys if they will offer them the necessary inducements while they are still in school or before they have decided what occupation to follow. The railways can easily pick 40,000 of these boys, if needed. I make the following suggestions with respect to a line of action which I believe will increase the interest of the boys in railway employment:

(1) Organize traveling schools of instruction in two large, roomy cars, preferably discarded steel coaches or parlor cars. Have one of these cars equipped for instruction, including a lecture room, an office, multigraph equipment and a kitchen; and supplied with the necessary instruction material, including modern moving-picture equipment. The other car should be fitted with 60 three-tier bunks and sufficient tents to put up outside, so that the outfit will be completely self-contained at any station along the line.

(2) Prepare a complete syllabus of training to cover the atmosphere of lectures and demonstrations over a ten-day period of camping for a class of 60 sixteen-year-old boys. These boys are to be recruited in the city, but the instruction should be given at the car-lecture camp, which should be kept away from the city and located at or near an intermediate terminal or division point, convenient to a yard, an enginehouse, a shop plant, a power plant, locomotives, cabooses and other things that will be of interest to the boys.

(3) Plan an itinerary to visit 135 major cities of Canada and the United States in one year.

(4) Publicize the itinerary among railway employees well in advance of arrival, for 75 per cent of the boys who will be recruited will be sons of regular railway employees. If this is done, it should be possible to have a full school attendance of 60 sixteen-year-old boys at each of the 135 major cities of Canada and the United States.

(5) Make arrangements through the public schools to recruit boys for the 10-day course and for the necessary leave at any time during the school year when the instruction cars are scheduled to arrive. These arrangements should contain a provision that the successful recruits would be accepted for temporary employment by the railways during their vacation period only if their attendance and scholarship records were satisfactory to the school authorities for the remainder of the school year. This will please the school authorities and tend to make the boys realize their responsibility to both the school and the railway giving the instruction.

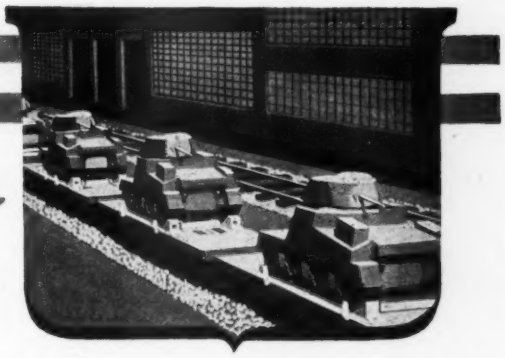
(6) The course of lectures on the movement of traffic and the maintenance of the fixed property should include at the minimum the following subjects:

Railway organization, construction, cars and locomotives, duties of various officers and traffic control systems.

(7) Each recruit would be required to pass a physical test before acceptance, and a similar test before he is returned home. He should also be given a test on the work covered by the course of instruction. His rating should then be kept on file, ready for the time of placement, preferably in his home city. The boys should be given to understand that their seniority rating will be based on retained interest in continued training.

D. P. McCallum.

NEWS of the Month



Record-Breaking War Traffic to Continue Through 1945

Speaking before the War Conference of the National Association of Railroad and Utilities Commissioners at Omaha, Neb., on November 14, Col. J. Monroe Johnson, director of the Office of Defense Transportation, stated that 1945 will not "offer any real relief or any sizable reduction in the burden that American transportation, either freight or passenger, will be called upon to carry,"

The demand for transportation is "far greater" today than at any time during the war, Colonel Johnson observed. In October "there was far more tonnage shipped out of our eastern ports than in any previous month since the war started; and the tonnage leaving our Pacific ports is reaching awesome proportions."

Killings Fail to Stop Holland Rail Strike

Despite wholesale executions of railworkers by German troops, the railway strike in Holland is still in full swing, according to a news dispatch from the Netherlands Information Bureau last month. According to information received, the Germans sought to stop the strike, which was called by the Netherlands government in London, England, at the request of the Allied Supreme Command, by executing 13 railway officials. This was followed by other executions and a wave of reprisals against the wives and children of the strikers. It was also reported that the striking Dutch railroad men, knowing how much the Allies depend for their success on the dislocation of the German railway system, have spurned offers of double wages and double rations, promised by the Germans if the railroaders would return to work.

Employment Drops While Needs Rise

Railroad employment during the one-month period from mid-September to mid-October decreased 1.27 per cent, from 1,427,833 to 1,409,663, but the October total was 3.11 per cent above October, 1943, according to the latest summary prepared by the Bureau of Transport Economics and Statistics of the Interstate Commerce Commission. The decrease for maintenance of way and structures employees was 4.08 per cent. This group showed an increase of 7.55 per cent over the corresponding 1943 period.

In the meantime, the U. S. Railroad Retirement Board reported that as of October 1, the railroads personnel needs had risen to 99,000 additional workers as compared with 91,000 as of September 1. The largest increase in unfilled jobs, 14 per cent, was reported for skilled trades helpers and apprentices, which classification includes bridge-and-building helpers. The board noted little change in the needs for other maintenance employees, except in the Northeast where demands were significantly smaller.

Railway Outfit Sees Action In France

A railway operating battalion sponsored by the Pennsylvania, which arrived in France a little more than two months after "D" day, has been kept busy operating alternate and secondary French railway lines to carry supplies to the fighting front, and make these lines take the place of main lines put out of service by demolition.

Headquarters, European Theater of Operations, reports that the battalion, under the command of Maj. Benjamin F. Hanst, Pittsburgh, Pa., has run into "all the hazards and difficulties that the war could spring on it." The army railroaders found that all communications had been torn down, and though station to station communication was later restored, normal operations were not practicable.

One of the few casualties suffered so far by this outfit occurred when a gasoline train with engines at the head and rear collided with the rear of another train. The engineer of the head engine, a veteran railroader, was killed. Other crew members, suffering a few slight burns and bruises, uncoupled the rear half of the train, which was pulled away by the engine at the rear, saving 22 out of 41 loads of gasoline.

New York Central Troops Build Own Work Train Equipment

Since mid-August, when the outfit moved into the wrecked yards at Faligny to take over its first job in France, a New York Central railway operating battalion "has compiled an enviable record of operation," according to word received from Headquarters, European Theater of Operations.

Recently cited with the bronze star, this battalion had taken over its assignment in France without the long previous training in military railway operations gained by many other railways units.

To enable the entire battalion to move on a moment's notice, it is constructing four complete trains, one each for the headquarters, maintenance of way, shop, and operating sections. The maintenance of way company's train, which has been completed, consists of 28 cars. The train includes: Offices and quarters for the officers as well as officers' mess, built from a French passenger coach; office coach, including drafting room, orderly room and mail room with quarters for the car personnel; the mess car, which with six cooks prepares hot meals for the crews on three 8-hour shifts; company supply car; combination company and mess supply car; motor car repair shop, fully equipped with tools to repair motor cars and other maintenance of way equipment while on the line; combination track supply and ammunition car; signal cars; bridge and building car, with a crew of 18; shower car; latrine car; German-built gondolas and flat cars; box cars and sleeping cars for enlisted personnel.

The battalion was activated in December 1943, and received its military training at Houston and Camp Bullis, Tex., and at Camp Claiborne, La. Technical training was received on the Claiborne & Polk railroad, operated by the U.S. Army.

Roads Plan Additional Streamliners

That a new era of streamlined passenger train construction awaits the release of materials and manpower, is indicated by plans just disclosed by several railroads. In some instances, locomotives and cars have been definitely ordered, while in others the program may extend over a period of three to five years.

The Great Northern has ordered five Diesel-drawn streamlined trains at a cost of $7,000,000 for service on the "Empire Builder," operating between Chicago and Seattle, via the Chicago, Burlington & Quincy between Chicago and St. Paul, Minn.

The Louisville & Nashville is planning a streamliner between Cincinnati, Ohio

and New Orleans, La., via Birmingham, Ala.

The Chicago & North Western is considering the extension of its fleet of "400's" into Iowa and Nebraska, and has reserved space to this end with the car builders.

The Chicago & Eastern Illinois is considering streamlined trains for its Chicago-Evansville, Ind., service and its Chicago-St. Louis service, and has asked the car builders for prices. The Illinois Central is also planning a new streamliner for its Chicago-St. Louis service. Its present "Green Diamond" is to be transferred to the Chicago-Waterloo, Iowa, runs.

The Atchison, Topeka & Santa Fe plans to extend its streamliner service to Ft. Worth, Tex., and Galveston. It has 80 cars on order.

The Southern Pacific expects to re-equip its "Cascade" operating between Oakland, Cal., and Portland, Ore., as a streamliner.

The Chicago, Rock Island & Pacific has asked the car builders for prices on additional streamlined passenger equipment. Other companies that have reserved space with car builders are the Pere Marquette, the New York Central and the Northern Pacific.

Five More Railway Engineers Commissioned in U. S. Army

Together with a number of other railroad officers, five railway engineering officers have recently been commissioned for service with the Transportation Corps, and have been granted leaves of absence to this end. They are: W. R. Armstrong, Jr., chief engineer, Nevada Northern, lieutenant-colonel; H. W. Jensen, division engineer, Chicago, St. Paul, Minneapolis & Omaha, lieutenant-colonel; L. Rossman, division engineer, Erie, lieutenant-colonel; H. L. Woldridge, division engineer, St. Louis-San Francisco, lieutenant-colonel; and D. T. Parrish, assistant to the chief engineer, Clinchfield, major.

All Railroads Win Safety Certificates

In recognition of the remarkable safety record achieved by the railroads as a whole under adverse war-time conditions, the American Museum of Safety and the Harriman brothers (W. Averill and E. Roland) did not this year content themselves with the usual "Harriman awards" to the individual railroads with the best safety records—but also bestowed "certificates of special commendation" upon the entire railroad industry. Last month these certificates were formally presented to the heads of the three regional associations of railway executives, as representatives of the individual railroads which compose these associations.

Schramm Fordair Compressors.—A 12-page catalog, No. 4215, has been published by Schramm, Inc., West Chester, Pa., describing its No. 60 type compressor and illustrating in detail the various combinations and types of mountings which adapt this unit to many forms of service. The catalog provides complete specifications and is attractively printed in color.

Personal Mention

General

W. M. Barr, chemical and metallurgical engineer on the Union Pacific, with headquarters at Omaha, Neb., has been promoted to research and standards consultant, with the same headquarters.

J. B. Kelly, general roadmaster on the Minneapolis, St. Paul & Salt Ste. Marie at Stevens Point, Wis., has been appointed a supervisor of safety, with headquarters at Minneapolis, Minn.

A. Mosby Harris, division engineer on the Columbus division of the Pennsylvania, with headquarters at Columbus, Ohio, has been advanced to superintendent of the Logansport division, with headquarters at Logansport, Ind., succeeding **Morton S. Smith,** whose promotion to superintendent of freight transportation at Chicago was reported in the November issue. Mr. Harris was born at Dumbarton, Va., on August 7, 1907, and attended Virginia Polytechnic Institute from 1927 to 1931. He entered railway service on June 15, 1931, as an assistant on the engineering corps of the Pennsylvania at Washington, D.C., later being transferred to Baltimore, Md., and Tyrone, Pa. On April 9, 1934, he was promoted to assistant supervisor of track at Clayton, Del., and was later transferred successively to Harrington and Wilmington, Del., Downingtown, Pa., and Harrisburg, Pa. In May, 1937, Mr. Harris was advanced to supervisor of track at Olean, N.Y., and in February, 1938, he was assigned to special duty in the office of the chief engineer at Philadelphia. On April 1, 1939, he was appointed supervisor of track at Johnstown, Pa., and in June, 1941, he was advanced to assistant superintendent of freight transportation, Western region, at Chicago. On January 16, 1942, Mr. Harris was promoted to division engineer on the Renovo division, and on May 16, 1944, he was transferred to the Columbus division, remaining in that location until his new appointment.

Engineering

Baron Laubenfels, construction engineer on the Chicago, Burlington & Quincy, with headquarters at Lincoln, Neb., has been promoted to division engineer on the Ottumwa division, with headquarters at Burlington, Iowa, succeeding **E. E. Young,** who has retired.

F. W. Creedle, division engineer of the Peninsula division of the Chicago and North Western, with headquarters at Escanaba, Mich., has been transferred to division engineer on the Lake Shore division, with headquarters at Green Bay, Wis. Mr. Creedle has been succeeded by **L. C. Smith,** acting division engineer on the Black Hills division at Chadron, Neb., who has been succeeded by **S. S. Long,** division engineer at Green Bay.

Donald L. Sommerville, assistant to the chief engineer, Central region, of the Pennsylvania at Pittsburgh, Pa., has been promoted to chief engineer succeeding **C. I. Leiper,** whose election to vice-president was announced in the November issue.

Eugenio Rodriguez y Parra, whose promotion to chief engineer, National Railways of Mexico was announced in the November issue, was born in Mexico City, on November 15, 1888, and received his higher education from the Engineering College of the National University of Mexico. Mr. Rodriguez entered railway service as an assistant engineer of construction for the National Railways of Mexico on June 1, 1917, holding various positions in the engineering department until August, 1925 when he was appointed chief engineer of the construction department. In June, 1931, he was promoted to chief of treating plants, occupying that position until October, 1935. Mr. Rodriguez engaged in private business from October, 1935, until February 28, 1944, when he re-entered railway service as chief engineer of the National Railways of Mexico.

K. J. Silvey, division engineer on the St. Louis division of the Pennsylvania, with headquarters at Terre Haute, Ind., has been appointed division engineer on the Columbus division, with headquarters at Columbus, Ohio, succeeding **A. Mosby Harris** whose appointment to superintendant on the Logansport division is reported elsewhere in these columns. **L. A. Evans,** assistant division engineer on the Ft. Wayne division, with headquarters at Ft. Wayne, Ind., has been appointed division engineer on the St. Louis division, relieving Mr. Silvey. **C. E. Gipe,** supervisor of track on the New York division, with headquarters at New York, has been appointed assistant division engineer on the Ft. Wayne division, succeeding Mr. Evans.

W. E. Griffiths has been appointed division engineer of the Canadian National, Ottawa division, at Ottawa, Ont., succeeding **W. H. B. Bevan,** whose appointment as district engineer of the Northern Ontario district was reported in the October issue.

R. C. Davidson, assistant division engineer on the Canadian National, has been promoted to division engineer of the Smithers division, with headquarters at Prince Rupert, B.C., succeeding **M. A. Burbank,** who has retired.

Mr. Burbank was born at Yarmouth, Me., on October 24, 1879, and received his higher education at the University of Vermont. He entered railway service in 1903 with the Michigan Central and two years later he went with the Grand Trunk Pacific (now the Canadian National) as a transitman, and in 1906 he went to Prince Rupert on townsite surveys. In 1907 Mr. Burbank was promoted to assistant district engineer at Winnipeg, Man., and a short time later he was further advanced to district engineer, with the same headquarters. He served with the armed forces during World War I, returning to the Canadian National in 1919 as a division engineer, the position he held at the time of his retirement.

(Continued on page 1152)

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V. H. Doyle, valuation engineer of the Pere Marquette at Detroit, Mich., has been advanced to office engineer in the office of the chief engineer, with the same headquarters, succeeding to the duties of **Paul Chipman,** who has retired from active service, after 43 years of service, at his own request. Mr. Doyle will continue as valuation engineer.

Mr. Chipman was born at Mt. Carmel, Ill., on July 28, 1873, and received his higher education at the University of Illinois, graduating in 1894. In 1901 he entered railway service with the Pere Marquette as chief draftsman, with headquarters at Saginaw, Mich., later being transferred to Detroit. In 1905 he went with the Canadian White Company at Montreal, Que., and three years later he resigned to enter private practice. In 1917 he was appointed senior civil engineer of the Bureau of Valuation, Interstate Commerce Commission, and in 1920 he returned to the Pere Marquette as valuation engineer, with headquarters at Detroit. In 1929 Mr. Chipman was promoted to the position he held at the time of his retirement.

Water Service

E. H. Liles has been appointed acting supervisor of water supply of the Atlantic Coast Line, with headquarters at Savannah, Ga.

Track

H. E. Carter, assistant supervisor of bridges and buildings on the Norfolk & Western at Portsmouth, Ohio, has been promoted to roadmaster, with headquarters at Petersburg, Va., succeeding **S. W. Cralle,** who retired on November 1.

C. R. Rook, has been appointed roadmaster on the Casper division of the Chicago, Burlington & Quincy, with headquarters at Greybull, Wyo., succeeding **R. Hurlbut,** who has been transferred to the Lincoln division at Central City, Neb., replacing **M. Irelan,** who has been appointed roadmaster on the Chadron division, with headquarters at Gillette, Wyo., succeeding **G. E. Armstrong,** who has been transferred to the McCook division, with headquarters at Orleans, Neb., to replace **R. M. Stevens,** assigned to other duties.

J. L. Varva, general foreman on the Iowa division of the Chicago, Milwaukee, St. Paul & Pacific has been promoted to roadmaster on the Hastings and Dakota division, with headquarters at Aberdeen, S.D., succeeding **R. H. Becker,** assigned to other duties.

A. P. Vogel, general foreman on the Iowa and Southern Minnesota division of the Chicago, Milwaukee, St. Paul & Pacific, has been promoted to roadmaster, with headquarters at Madison, S.D., succeeding **F. J. Kovaleski,** who has been transferred to Austin, Minn., relieving **F. H. Larson,** who has retired.

L. P. BonFardin, general foreman on the Buffalo division of the Pennsylvania, with headquarters at Buffalo, N.Y., has been promoted to assistant supervisor of track on the Pittsburgh division, with headquarters at Derry, Pa., succeeding **A. B. Baker,** who has been promoted to supervisor of track on the Grand Rapids division, with headquarters at Grand Rapids, Mich. Mr. Baker replaces **P. O. Hansen,** who has been transferred to the Cincinnati division, with headquarters at Cincinnati, Ohio, replacing **J. E. Chubb,** who has been appointed supervisor of track on the New York division, succeeding **C. E. Gipe,** whose promotion to assistant division engineer on the Ft. Wayne division is reported elsewhere in these columns.

E. D. Tully, relieving roadmaster on the Canadian Pacific at Winnipeg, Man., has been promoted to roadmaster, with the same headquarters, succeeding **W. T. Wilding,** who has been transferred to another district with the same headquarters, replacing **B. Hardy,** who has retired on account of ill health. **F. W. H. Minifie,** relieving roadmaster on the British Columbia district at Cranbrook, B.C., has been advanced to roadmaster, with the same headquarters, replacing **Oscar Otherson,** assigned to other duties. **Daniel Shaw,** relieving roadmaster on the Regina division at Rosetown, Sask., has been promoted to roadmaster, with the same headquarters, succeeding **R. O. Renwick,** who has been assigned to other duties. **W. J. Montgomery,** roadmaster at Deloraine, Man., has been transferred to Winnipeg, replacing **C. E. Cronk,** who has been transferred to Deloraine.

W. R. Payne, roadmaster on the Wichita division of the Missouri Pacific at Conway Springs, Kans., has been transferred to the Kansas City Terminal division, with headquarters at Kansas City, Mo., succeeding **I. E. Short,** who has been transferred to Conway Springs, replacing Mr. Payne.

Clyde C. Van Stratten, whose promotion to roadmaster on the Wichita division of the Missouri Pacific, with headquarters at Yates Center, Kans., was reported in the November issue, was born at Rhineland, Mo., on May 4, 1908, and entered railway service with the Missouri Pacific in 1926 as a section laborer on the Eastern division. He held several minor positions in the bridge and building department and the maintenance of way department until 1938, when he was promoted to section foreman, and later to extra gang foreman on the Eastern division. On April 1, 1942, Mr. Van Stratten was advanced to track supervisor on the Colorado division, with headquarters at Scott City, Kan., the position he held at the time of his new appointment.

Bridge and Building

W. T. Brice has been appointed bridge and building master on the Regina division of the Canadian National, with headquarters at Regina, Sask., succeeding **A. J. Rothwell,** who has retired.

M. W. Clark has been appointed supervisor of building repairs on the Atlantic Coast Line, with headquarters at Savannah, Ga., succeeding **D. N. Cameron,** assigned to other duties. **J. B. Bivings** has been appointed assistant supervisor of building repairs, relieving **J. A. Hughes,** assigned to other duties.

R. C. Jacobus, building inspector on the Illinois Central, has been promoted to supervisor of bridges and buildings on the Iowa division, with headquarters at Waterloo, Ia.

Fred Lichtenberger, bridge inspector on the Erie at Jersey City, N.J., has been advanced to assistant master carpenter on the New York division, with headquarters at Paterson, N. J.

George W. Lee, assistant supervisor of bridges and buildings on the Syracuse division of the New York Central, with headquarters at Rochester, N.Y., has been promoted to supervisor of bridges and buildings on the St. Lawrence division, at Watertown, N.Y., succeeding **Jesse A. Lewis,** who has been transferred to the Buffalo division, at Buffalo, N.Y., relieving **J. K. Bonner,** assigned to other duties. **Joseph S. Lally,** bridge and building inspector on the Buffalo division at Rochester, has been advanced to assistant supervisor of bridges and buildings at that point, replacing Mr. Lee.

Mr. Lee was born at Amsterdam, N.Y., on April 23, 1898, and entered railway service on the New York Central as an iron worker at Rochester on December 2, 1923. On July 10, 1933, he was advanced to bridge and building foreman at Syracuse, and on October 21, 1940, he was promoted to bridge and building inspector at Rochester. Mr. Lee was further advanced to assistant supervisor of bridges and buildings at Rochester on March 1, 1943, which position he held until his recent promotion.

R. V. Wickman, assistant supervisor of bridges and buildings on the Eastern division of the New York Central at Beacon, N.Y., has been promoted to supervisor of bridges and buildings of the Albany division of the Boston & Albany (operated by the New York Central), with headquarters at Pittsfield, Mass., succeeding **E. M. McCabe,** who retired because of ill health on November 1. **George H. Hout,** assistant supervisor of bridges and buildings on the Syracuse division of the New York Central at Syracuse, N.Y., has been transferred to Beacon, replacing Mr. Wickman, and **Louis F. Yeager,** bridge and building inspector at Syracuse, has been advanced to assistant supervisor of bridges and buildings at that point, relieving Mr. Hout.

Mr. Wickman was born in New York on September 8, 1902, and entered railroad service as a carpenter on the New York Central at Beacon on July 7, 1920. On January 1, 1933, he was promoted to bridge and building foreman at that point, and on March 1, 1940, he was advanced to the position he held at the time of his recent promotion.

Special

H. A. Paul, chief treating inspector on the Chicago, Rock Island and Pacific, with headquarters at Little Rock, Ark., has been promoted to assistant tie and timber supervisor, with the same headquarters. Mr. Paul has been succeeded

(Continued on page 1154)

MODERN EQUIPMENT

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Reduces Cost

A clean track is a safer track. This Kalamazoo discer keeps the ballast in good condition and eliminates vegetation growth.

It is fast in operation because — like all Kalamazoo Section Cars — the axles are mounted on Timken Tapered Roller Bearings, thereby removing all speed restrictions as far as bearings are concerned.

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TAPERED ROLLER BEARINGS

by **B. F. Finger,** formerly chief clerk to the chief treating inspector at Little Rock.

Obituary

Michael Henry, who retired in 1937 as a track supervisor on the Chicago & Eastern Illinois, with headquarters at Villa Grove, Ill., died in a Chicago hospital on November 1.

Edward Thomas Johnston, who served at one time as assistant engineer and as special engineer on the Erie, and retired in 1938 as chief draftsman in the engineering department of that road, died at Tucson, Ariz., recently.

Frank J. Geraghty, who served from 1903 to 1907 as chief engineer of the Chicago-Milwaukee Electric (now the Chicago, North Shore & Milwaukee), with headquarters at Chicago, died at his home in Lake Bluff, Ill., on November 19.

Edward A. Pyles, assistant engineer of buildings on the Baltimore & Ohio at Baltimore, Md., died November 6. He was 53 years old. Mr. Pyles entered the engineering department of the Baltimore & Ohio in 1916 as a draftsman in the office of the chief engineer and was named chief draftsman on June 1, 1916. He became assistant engineer of buildings on October 1, 1942.

Trond C. Sundem, assistant engineer, office of the engineer, maintenanee of way, system, of the New York Central, with headquarters at New York, died suddenly at his home in Woodlawn, N.Y., on September 7. Mr. Sundem, who was 66 years old, was born in Christiana, Norway. He entered the service of the New York Central on May 17, 1912, as draftsman to the chief draftsman, Grand Central Terminal, New York, and subsequently served as assistant engineer on the staff of the Regional Director, the senior vice-president and the assistant to the president. In 1940, he was appointed to the position he held at the time of his death. In recent years, he was in charge of the design of special track work. Mr. Sundem was also secretary of the New York Central System Engineering committee.

LeTourneau Guide for Buyers—A 12-page brochure entitled "A Guide for Your Postwar Equipment Buying," has been published by R. G. LeTourneau, Inc., Peoria, Ill. Designed to discuss five important factors concerning postwar purchasing of earthmoving machinery, the brochure utilizes text and pictures to tell of the record number of LeTourneau products which have been built during the last ten years.

Repairing Flapper Valve Chippers—The Ingersoll-Rand Company, New York, has published a wall chart, 22 in. by 38 in. in size, entitled Easy Repair Operations for I-R Flapper Valve Chippers. Printed in two colors, the chart is graphically illustrated with an "exploded view" of the hammer, a cross-sectional view, a number of cross-sections of the various parts, and drawings of the several tools required for proper maintenance.

Association News

Roadmasters' Association

President E. L. Banion has called a meeting of the Executive committee in Chicago on December 16, to give consideration to routine association matters and to select the personnel of technical committees for the ensuing year. It is requested that all members who have not expressed their preference for committee assignment by returning the cards sent to them earlier, do so promptly.

Effective November 16, Elise LaChance has been appointed secretary of the association, succeeding Elinor V. Heffern, and will have new headquarters, jointly with the Bridge and Building Association and the Superintendents Association, in Room 901 of the Manhattan building, 431 South Dearborn street, Chicago.

Metropolitan Maintenance of Way Club

At the next meeting of the club, which will be held at the Hotel Governor Clinton, New York City, at 12:30 p.m. on December 7, the principal speaker will be Col. A. L. Bartlett, engineer maintenance of way of the New York, New Haven & Hartford, whose address will be entitled "The New Era." In accordance with past practice, this meeting is scheduled on the same day as the annual dinner of the New York Railroad Club.

The last meeting of the club was held at the Hotel Governor Clinton on October 26. This meeting was featured by four addresses on separate phases of the subject "When the War Ends—What Then in Track Maintenance?" C. E. Adams, chief engineer, New York Zone, Pennsylvania, described the general picture; C. B. Bronson, inspecting engineer, New York Central System, discussed rails and fastenings; M. S. Miller, acting engineer maintenance of way, Reading, discussed ties, ballast and roadbed; and C. K. Scott, engineer maintenance of way, Eastern district, Erie, spoke on men, methods and machines. More than 80 members and guests were in attendance.

H. J. Weccheider, president (division engineer, Erie, Jersey City, N.J.), announced that John S. Vreeland, eastern editor, *Railway Engineering and Maintenance*, had been appointed secretary-treasurer by the Executive committee to fill out the unexpired term of Merwin H. Dick, who has been transferred to the Chicago office of that publication as managing editor.

Maintenance of Way Club of Chicago

With an attendance of 225 members and guests, the November meeting of the Club was held on Monday evening, November 27, in the Ambassador Room of Huyler's Restaurant, Chicago. The meeting, which featured Roadbed Grouting, was addressed by John R. Rushmer, roadway engineer, system, Atchison, Topeka & Santa Fe, who described details of the extensive roadbed grouting being carried out by his road. Mr. Rushmer's discussion was supplemented by a showing of the Portland Cement Association's technicolor sound film of this type of work on several roads, and by comments from the representatives of several of the supply companies which have taken the lead in developing materials and equipment for carrying out this type of roadbed stabilization work. A detailed article describing the roadbed grouting on the Santa Fe appeared in the November issue of *Railway Engineering and Maintenance*, page 1016.

Bridge and Building Association

Effective November 16, the association has a new secretary—Elise LaChance, and has occupied a new office jointly with the Roadmasters' Association and the Superintendents Association in Room 901, the Manhattan building, 431 South Dearborn street, Chicago.

Late in November, a letter was mailed to all members soliciting their cooperation in committee work and asking them to express their choice of the committees on which they desire to serve. It is urged by President J. L. Varker that members return promptly the post card which accompanied this letter, indicating their preference for committee assignments, so that the Executive committee can arrange the personnel of all committees at its next meeting, which will be held in Chicago on December 11.

A second letter from President Varker will go to all members early in December, accompanied by reprints from the November issue of *Railway Engineering and Maintenance*, of all technical committee reports presented before the Executive meeting of the association held in Chicago on October 18.

American Railway Engineering Association

The Board of Direction and the Nominating committee of the association will hold meetings in Chicago on December 6, and the Committee on Rail, the only technical committee which has scheduled a December meeting, will meet in Chicago on December 7.

During the last month, a Committee on Arrangements was announced to handle the details of the next annual meeting, with Guy P. Palmer, engineer maintenance of way and construction, Baltimore & Ohio Chicago Terminal, as chairman; G. R. Westcott, assistant engineer, Missouri Pacific, first vice-chairman; and A. B. Pierce, engineer of water supply, Southern, second vice-chairman. It has also been announced that the Association of American Railroads has approved its budget of expenditures for 1945, which includes $138,110 for research to be conducted by the Engineering division. There are a total of 22 separate items in the Engineering division list, which include $45,000 for the work on the Committee on Rail; $25,000 for the work of the Committee on Track; $25,000 for the continuation of the Engineering division's share of the work being conducted by the joint Committee on Relation Between Track and Equipment; and $16,000 for the work of the Committee on Impact. The only new item in the approved list of projects is $10,000 for studies to be conducted under

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comprises 154 pages of helpful data, replete with photos, drawings and specifications, covers every track work need. Copy on request.

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Standard and Special Track Work for Steam Railroads Since 1882

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Successors to

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the direction of the Committee on Roadway and Ballast on the grouting of roadbed.

Five committees of the association held meetings in November as follows: Co-Operative Relations with Universities, which met in Chicago on November 1; Records and Accounts, which met in Chicago on November 1 and 2; Wood Bridges and Trestles, which met in Chicago on November 10; Roadway and Ballast, which met in Chicago on November 15 and 16; and Impact, which met in Chicago on November 17. Bulletin No. 448 went out to members during November, and it is expected that Bulletin No. 449 will be mailed to members by the middle of December. This latter bulletin will include reports of the Committees on Buildings, Highways, Economics of Railway Labor, Maintenance of Way Work Equipment, Waterproofing, and Yards and Terminals.

Supply Trade News

General

The **DeVilbiss Company,** Toledo, Ohio, has been awarded the Army-Navy "E" for the third time for high achievement in the production of war material. This company has moved its Cincinnati, Ohio, district sales headquarters to 410 American Building, Central Parkway and Walnut Street.

The Timkin Roller Bearing Company, Ltd. (a subsidiary of the **Timkin Roller Bearing Company,** Canton, Ohio), has completed plans for the erection of a new bearing and rock bit plant at St. Thomas, Ont. The structure will be built on 75 acres of ground purchased recently by the company from the city of St. Thomas.

The LaPlant-Choate Manufacturing Company, Inc., Cedar Rapids, Iowa, has been awarded for the fourth time the Army-Navy Production Award for outstanding achievement in the development and production of equipment essential to the war effort. This award entitles the company to add a third star to its E-award flag.

Plans for a large expansion in its production and sale of high-strength, low-alloy steels to meet anticipated post-war demands for light-weight equipment in the transportation field were announced on November 3 by the **Republic Steel Corporation.** N. J. Clarke, vice-president in charge of sales, stated that Republic has acquired license rights for the manufacture of "Cor-Ten" and "Aldecor" steels, which it will market in addition to its own trademarked product, "Republic Double Strength Steel." "Cor-Ten" is a patented steel produced by Carnegie-Illinois Steel Corporation, and other subsidiaries of the United States Steel Corporation, and "Aldecor" was the result of research by the Alloys Development Corporation of Pittsburgh, Pa., and was developed by the Republic Steel Corporation.

Personal

Harold F. Allen, head of the Cedar Rapids (Iowa) hydraulic plant of the **Link-Belt Speeder Corporation,** Chicago, has been promoted to chief engineer, with headquarters at Chicago and Cedar Rapids.

E. H. Branning has been appointed general manager of the **Wood Shovel & Tool Co.,** at Piqua, Ohio. Mr. Branning served from 1923 to 1931 as vice-president and

E. H. Branning

general manager of the J. F. Rittenhouse Manufacturing Company. When this company was consolidated with two others in 1931 to become the CKR Company, Mr. Branning was appointed president of the new firm, remaining in that position until the CKR Company was merged with the American Fork & Hoe Co., in 1937. Mr. Branning continued with the latter company in an executive capacity until 1942 when he joined the army service forces as head of the Hardware and Tools Procurement division, the position he was occupying at the time of his new appointment.

David Newhall has been elected a vice-president of **Iron & Steel Products, Inc.,** in charge of the New York district, and with headquarters at New York. Mr. Newhall served with this company in a similar capacity some years ago with the same headquarters.

Lloyd O. Stratton has been appointed a representative of the **Nordberg Manufacturing Company,** to handle the company's line of railway maintenance equipment and tools in the Denver, Colo., area, with headquarters at Denver.

R. W. Davis, who has been on leave of absence from the **Allis-Chalmers Manufacturing Company** to serve with the electrical equipment branch of the War Production Board, has returned to the company and has been promoted to general manager of the firm's plant at Norwood, Ohio. Mr. Davis is a graduate of the Massachusetts Institute of Technology and of the University of South Dakota. He joined Allis-Chalmers in 1910 after completing the company's graduate engineer training program, and prior to serving with the War Production Board, he was assistant manager of the firm's electrical department located at Milwaukee, Wis.

A. J. Schmitz, manager of the Seattle (Wash.) office has been promoted to Pacific regional manager, with headquarters at San Francisco, Cal. Mr. Schmitz joined Allis-Chalmers in 1914 after graduating from college as a mechanical and electrical engineer. For 11 years he was in charge of the company's operations in Cuba, returning to the United States to take over the position he held at the time of his new promotion.

John A. English, Jr., sales engineer of the **Carnegie-Illinois Steel Corporation** (a subsidiary of the United States Steel Corporation), has been promoted to assistant manager of railroad materials sales, with headquarters at Chicago. Mr. English received his higher education at Alabama Tech and Carnegie Tech, and joined Carnegie-Illinois 14 years ago. In 1937, after already having held several important positions in various departments of the company, he was advanced to the position he was holding at the time of his new appointment.

Eugene E. Weyeneth and **Joseph G. Van de Loo,** members of the advertising staff of **R. G. LeTourneau, Inc.,** have been promoted to manager and assistant manager, respectively, of the company's advertising department, with headquarters at Peoria, Ill.

John P. Roche, assistant to the president of the **Oliver Iron & Steel Corporation,** Pittsburgh, Pa., has been appointed an industry member of the National War Labor Board at Washington, D.C. For the last 18 months Mr. Roche has served as an industry member of the Third Regional War Labor Board at Philadelphia, Pa.

Obituary

Enoch Bostrum, technical director of the Osmose Wood Preserving Company, with headquarters at Buffalo, N.Y., died at Jackson, Mich., on October 21, while on a business trip to that city. Mr. Bostrum attended the University of Arizona, and after graduating he went with the Inland Steel Corporation, and later with the Belt Railway of Chicago. In 1932 he resigned to join the Morrison Metalweld Process, Inc., with headquarters at Buffalo, and three years later he joined Osmose, remaining with that company up to the time of his death.

J. W. Sullivan, founder and chairman of the board of Skilsaw, Inc., died at his home in Evanston, Ill., on October 26. Mr. Sullivan spent his early years with the company in selling activities, and became president of the firm in 1926. In 1942 he was elevated to chairman of the board. Up to within a short time of his death Mr. Sullivan was actively engaged in directing Skilsaw's production and sales policy, and spent considerable time in fostering employer-employee relations.

Hoisting Engine Bulletin—The American Hoist & Derrick Co., St. Paul, Minn., has published an 8-page bulletin featuring its line of steam hoisting engines.

SIDETRACK Maintenance Worries in 1945

with Mall REG. U.S. PAT. OFF. PORTABLE POWER TOOLS

ARMY E NAVY

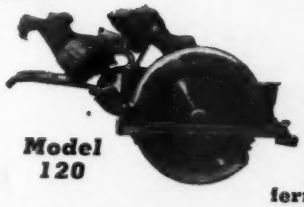
MALL Maintenance Protects Rails. Extends Life of Rolling Stock. Assures Better Fitting and Acting Switches.

Mall 6 H.P. PORTABLE RAIL GRINDER

A highly efficient, safe, and economical, Off-The-Track unit. Can be furnished with outrigger or without. Easily wheeled anywhere on the right-of-way. Easy starting gasoline engine and heavy duty flexible shaft makes unit readily adaptable to rail, frog, switchpoint and crossing grinding. Ruggedly constructed for long hard usage.

1½H.P. Mall Gasoline Engine CONCRETE VIBRATORS

For placing low-water-cement-ratio concrete on bridge, dock, pier, retaining wall and all other concrete construction. Variable speed gasoline engine operates 8 other interchangeable tools. Also 3 H.P. wheelbarrow and round base mounted units and pneumatic models for immediate delivery.



Model 120

Mall Saw

Two ELECTRIC models —12" and 8½" Blade. Cutting capacities 4½" and 2½". For sawing and ripping heavy lumber, cutting nonferrous metal, cutting and scoring tile, stone and concrete with an abrasive wheel.

Mall CHAIN SAW

5 H.P.

5 H.P. MALL Gasoline Engine Chain Saw 36" capacity. Also available in 24" and 48" sizes. Pneumatic models with same capacity.

Two laborers with a MALL Chain Saw can cut 60-18" piles or heavy timbers per hour. Makes cuts at all angles. Gasoline engine has automatic stall-proof clutch, handle throttle and automatic lubrication. Immediate delivery on most models.

Write for literature and prices to Railroad Department.

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Does The Work of an Army of Men!

Fight Snow and Ice with the JORDAN

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SNOW PLOW

Make certain that your railroad is prepared to keep service up to par—no matter what the weather—by using Jordan to economically assist in keeping tracks free and clear of snow and ice this winter. The Jordan Plow can be used in cleaning track under almost all conditions, and is especially adapted to removing snow and ice in yards and terminals.

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Require no air compressor and hose—
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100% Self-Contained

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Gasoline Hammer

PAVING BREAKERS

Power to spare—

- Breaking Concrete
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Literature on request

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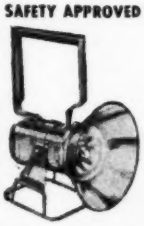
THE NEW JUSTRITE SAFETY FLASHLIGHT No. 17-S (below)
1500 candlepower . . . uses 3 standard cells. Fits in the palm of your hand, on belt clip or stands alone. The plastic case "seals-in" Justrite safety features. Approved for Safety . . . by Underwriters' Laboratories, Inc., U. S. Bureau of Mines and by the Bureau of Marine Inspection.

TRAINMAN'S LANTERN-Model No. 40 (at left)
Rugged and dependable. Powerful spot beam signals full 110 car drag. Has one bulb extended to provide direct light for yard signals—one bulb to provide a powerful spot beam. Made with replaceable parts.

SAFETY APPROVED INSPECTOR'S LANTERN-Model No. 46-S
Powerful beam . . . polished 7-inch reflector. "Kick-out" bulb sockets and spark-proofed guard. Approved by U. S. Bureau of Mines for Safety . . . Justrite.



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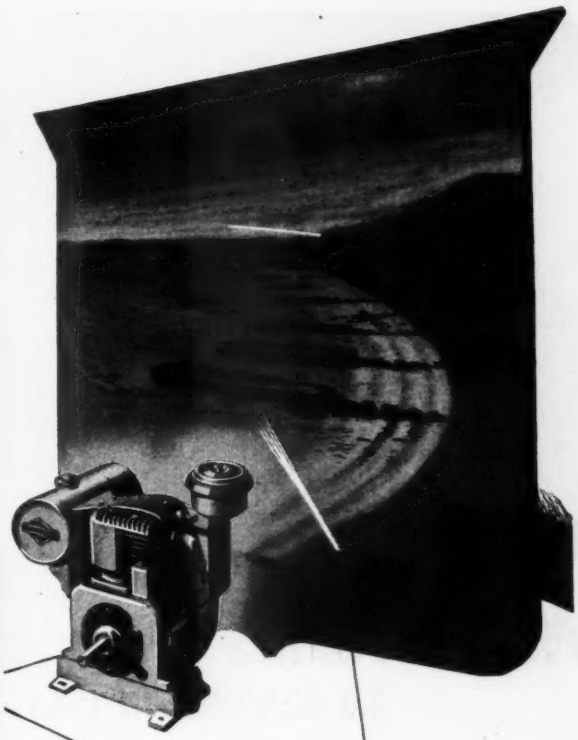

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From newly established positions, portable beacon units guide and warn supporting ships and aircraft. Their electric generating plants are powered by rugged, quick-starting Briggs & Stratton engines —another one of many vital war services by hundreds of thousands of Briggs & Stratton engines.

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Briggs & Stratton leadership in design, engineering and precision manufacture is backed by the performance record of more than TWO MILLION Briggs & Stratton engines—and a quarter-century of *continuous* production of *"air-cooled power."* You can profit by this experience in your plans for the future — whether you manufacture, sell or use power equipment. BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U.S.A.

New Worlds
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Now is the time to check your needs for a thoroughly modern, quality built and ever dependable Layne Well Water System. You will want the best that money can buy; a water system that will last the longest, take less in upkeep cost and operate at a new low in economy.

Layne Pumps and Well Water System have a reputation that extends around the world. They are more widely used than any other make on the face of the globe. They are serving more cities and industries than all other makes combined. As a pioneer in both well installation and pump building, Layne has created, proven and uses exclusively the greatest number of major efficiency features.

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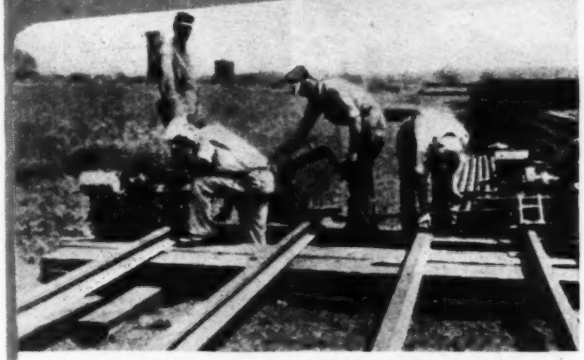
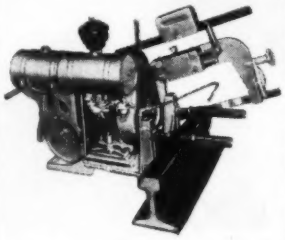
High Efficiency - Low Cost

RAIL CUTTING



with **RACINE** *High Speed*

PORTABLE RAIL SAWS



Here is a saw that saves valuable man hours and material. It does a smooth, clean rail cutting job.

It is compact, light in weight so that it can easily be transported for "on the track," yard or shop work. The use of Racine Rail Cutters eliminates possible damage to grain structure caused by torch cutting and the old "nick and break" method of rail cropping.

These saws are also ideal for proper cutting and fitting of rail at interlocking plants, crossings, curves and switches. They are available with gasoline, electric or compressed air motors. For full particulars write for Bulletin 58A. Address Dept. RE-S.

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See the complete line of Racine Shop Saws for general or high speed production cutting of all metals. Capacities 6" x 6" to 20" x 20". Ask for Catalog No. 12.

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TOOL AND MACHINE COMPANY

Standard for Quality and Precision

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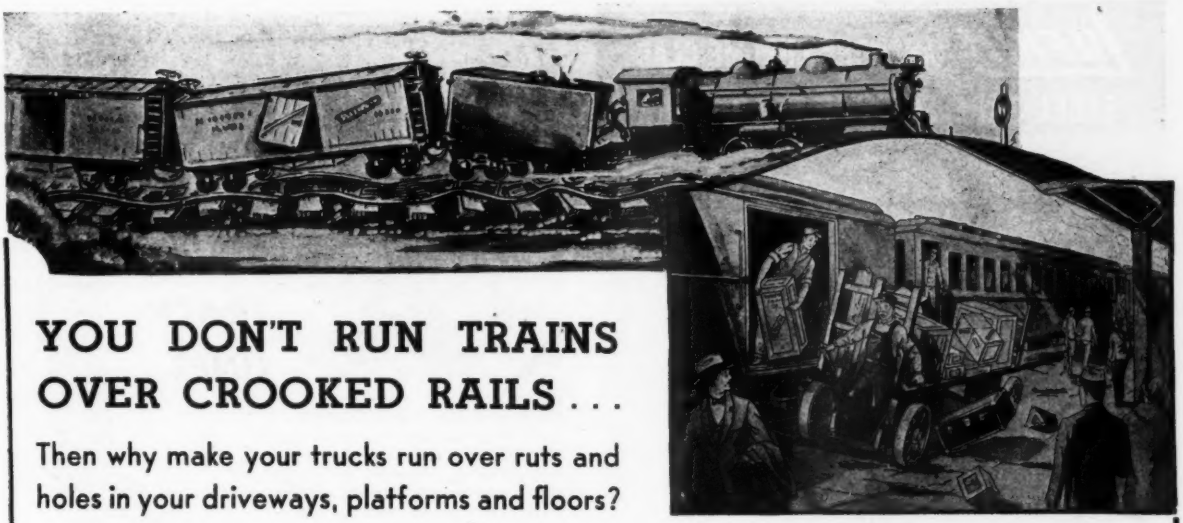

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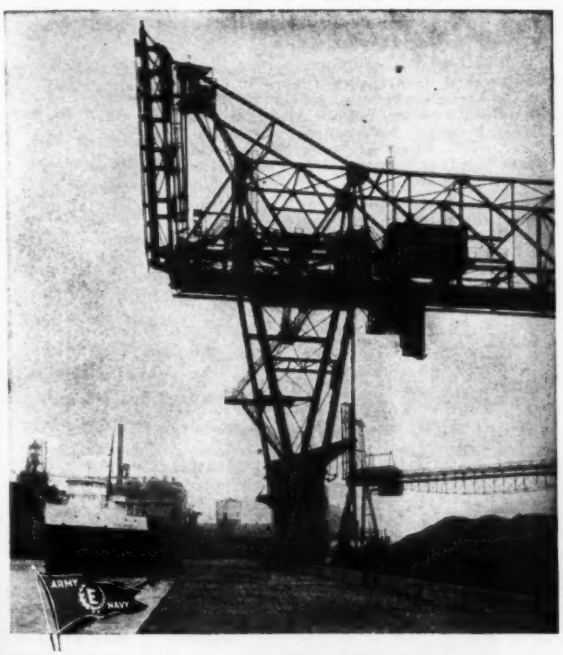

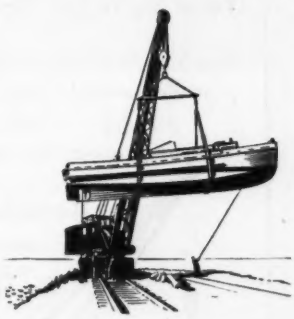

Shown here are two examples of Industrial Brownhoist material handling equipment. At right is an I.B. diesel locomotive crane known the country over for its long life and low cost operation.

At left is shown an I.B. 10-12 ton traveling bridge crane for unloading and storing iron-ore. Bridge span is 340 feet center to center of runways. Raisable apron extends 112 feet overall out from the center line of bridge pier and is hinged near end of dock to clear the boat rigging while docking.

Regardless of your material handling problem, chances are I.B. engineers have met and solved a similar one in the past.

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INDUSTRIAL BROWNHOIST CORP. • BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago • Agencies: Detroit, Birmingham, Houston, Denver, Los Angeles, San Francisco, Seattle, Vancouver, B.C., Winnipeg, Canadian Brownhoist Ltd., Montreal, Quebec.

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Capacity 3 and 5 tons. Gas or Diesel powered tractor unit, load carried on driving wheels; solid or pneumatic tires; all welded frame; boom 16' standard (longer booms available); tip spool or sheaves optional.

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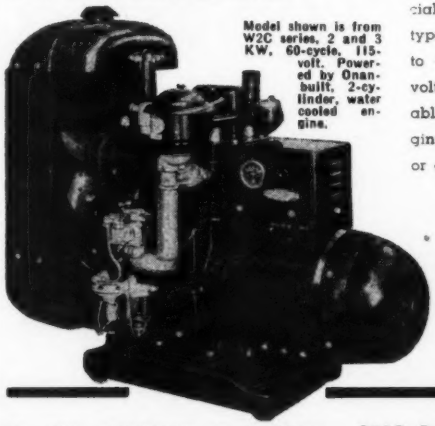

Model shown is from W2C series, 2 and 3 KW, 60-cycle, 115-volt. Powered by Onan-built, 2-cylinder, water cooled engine.

Models range from 350 to 35,000 watts. A.C. types from 115 to 660 volts: 50, 60, 180 cycles, single or three-phase; 400, 500, and 800 cycle, single phase; also special frequencies. D.C. types range from 6 to 4000 volts. Dual voltage types available. Write for engineering assistance or detailed literature.

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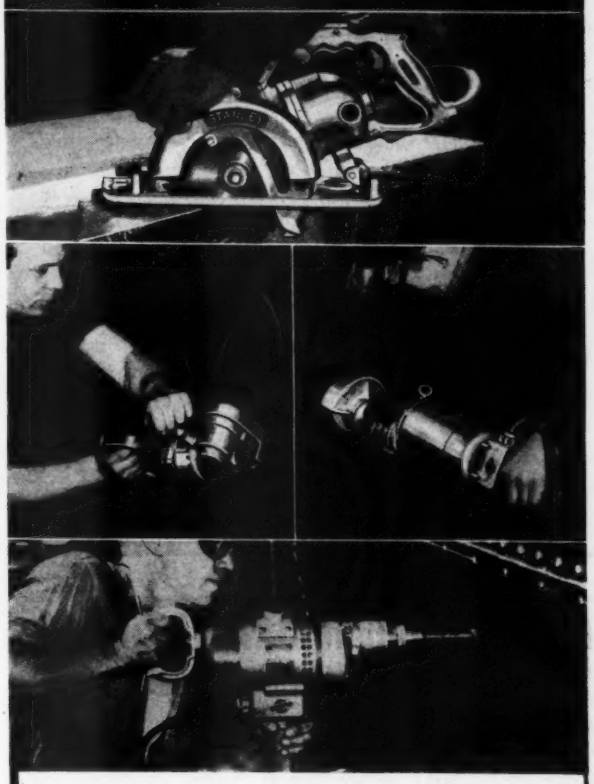

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Using Stanley Portable Electric Tools is the most efficient, cheapest and fastest means of drilling, sawing, grinding and shearing on maintenance jobs because these lightweight tools are taken to the work – in the shop or out on the line. They operate from a portable gasoline generator or from standard light outlets. Write for specification sheets. Stanley Electric Tool Division, The Stanley Works, New Britain, Connecticut.

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There's more to babbitting connecting rod bearings than simply applying the metal. Not only must the work be expertly done, but it is important that frequent detailed chemical analyses be made of materials in order to provide a dependable safeguard against inferior quality bearing metal, and to assure constant uniformity.

Wisconsin Engine connecting rod bearings are babbitted in our own plant, under our own complete control. A careful check is maintained to make sure that the metal is always what it *should* be and that it is applied *the way it should be*. This helps to make a better engine . . . designed to give better service on your equipment.

Most H.P. per pound

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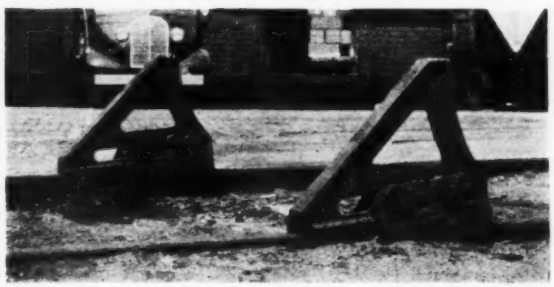
"HOLD EVERYTHING"

At Stub Ends of Tracks With Q and C Car Stops



Q and C Car Stops wedge to the rails, no drilling being necessary, and are applied with very little labor.

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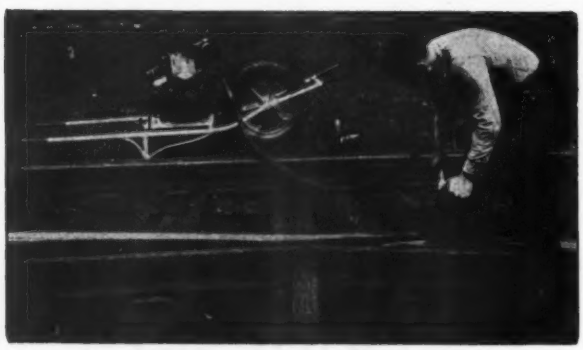
Keep your track, switch points, frogs, crossings and joints in trim with these rugged efficient easy to use grinders. Available in many models—with flexible shaft and attachment for cross-grinding joints and extreme ends of switch points. First choice of leading railways. Write for latest data bulletins.



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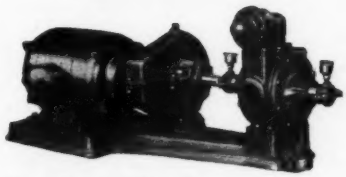
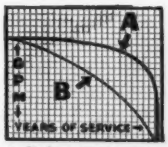
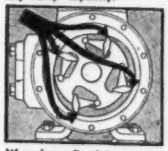
the PUMP that is "Self-Adjusting for Wear"





A—Blackmer pump capacity. Note the long sustained efficiency. B—Conventional Rotary Pump capacity.



Wear is confined to the tips of the buckets, which automatically compensate for wear.

This much can wear away, without affecting the capacity of the pump.

When worn out, replace the buckets and the pump is restored to normal efficiency.

for handling

DIESEL FUEL and FUEL OILS

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have been standard equipment for more than forty years.

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1 to 750 GPM. Pressures to 300 psi.
Single or multiple units.
All standard drives.

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1½ to 25 GPM—54 Models.
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POWER PUMPS · HAND PUMPS

. . . This Track Jack Is Hard To Wear Out!

Simplex No. 217 Track Jack, 15-tons capacity. Height 22¾". Lift 13". Toe lift 2⅝" from ground level. Weight 60 lbs.

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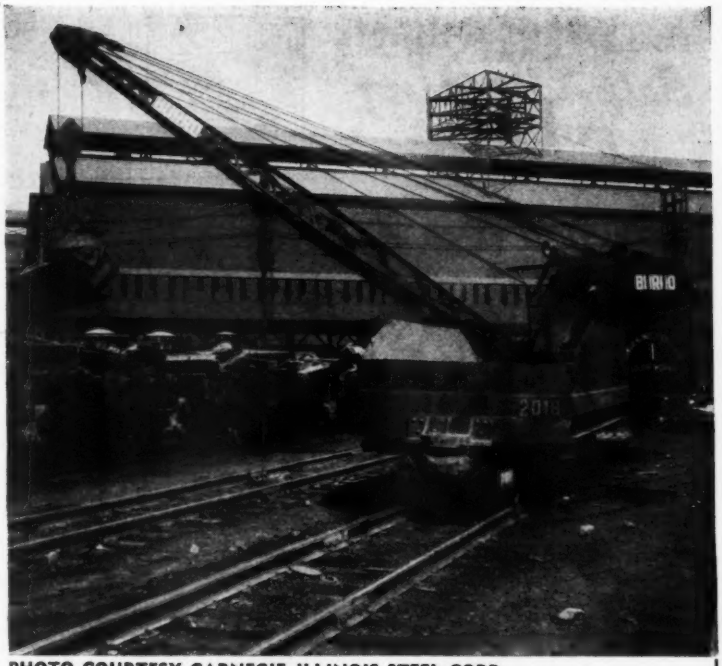

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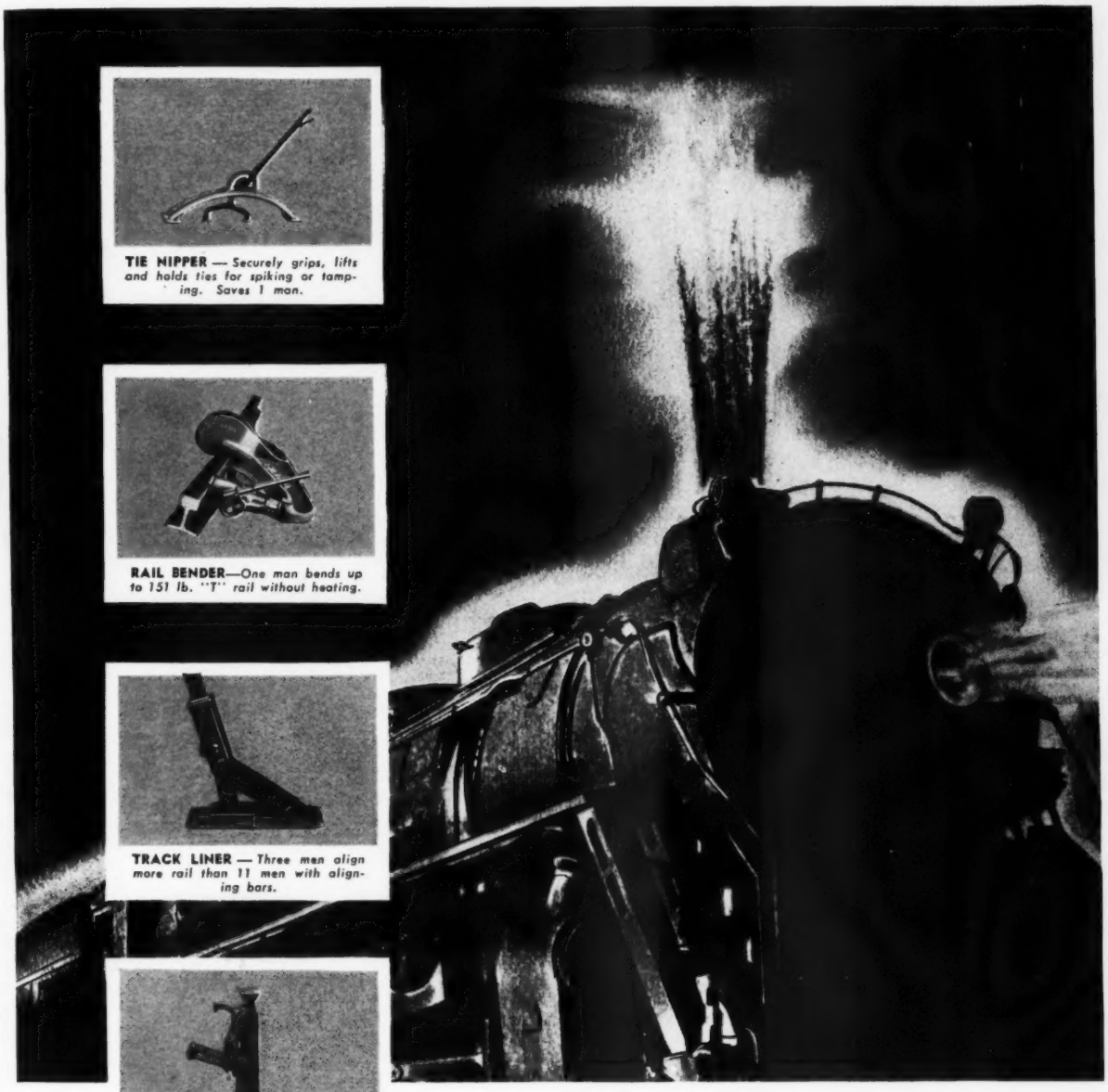

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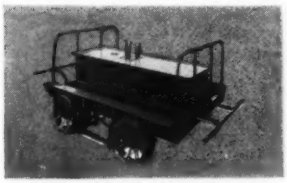

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